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THE MAGAZINE FOR INFORMATION EXECUTIVES

COVER STORY

Business Drivers' Ed

How Today's
Top Executives
Are Learning About
Technology

ALSO INSIDE

WEBMASTER

Electronic Money
For Online Deals

Manville Corp.'s
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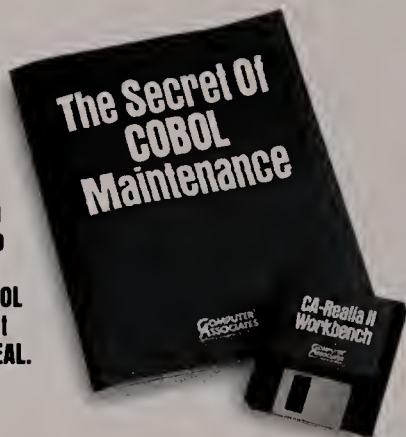
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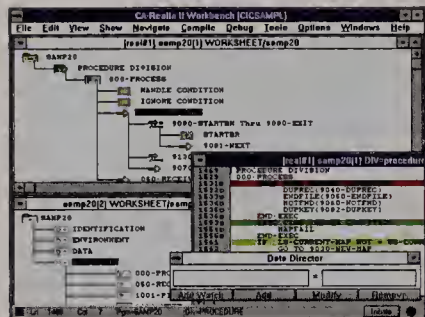


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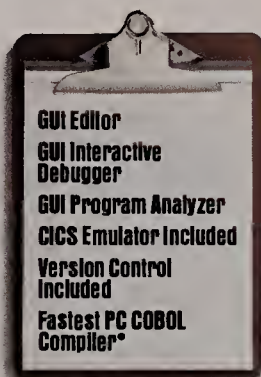
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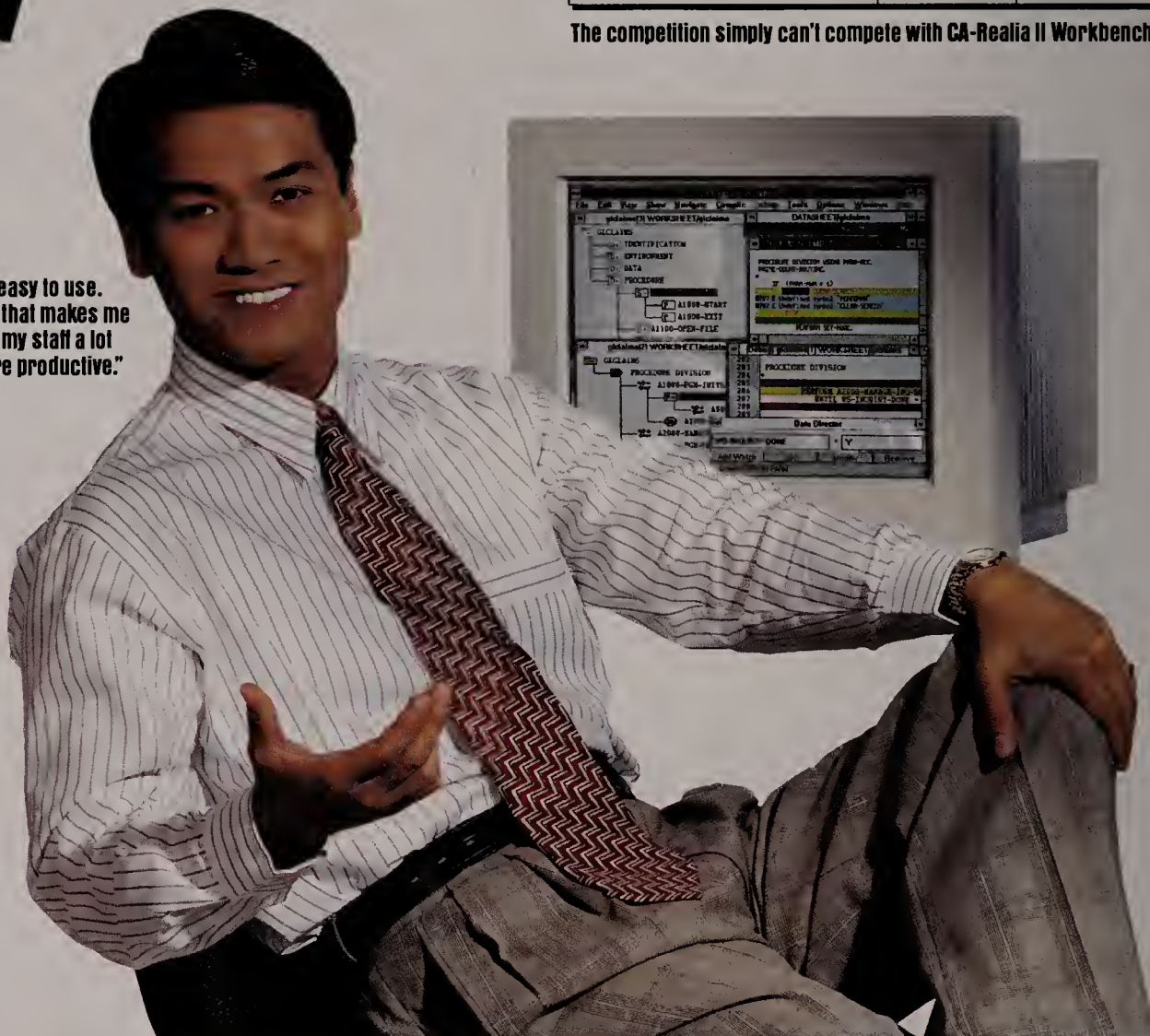
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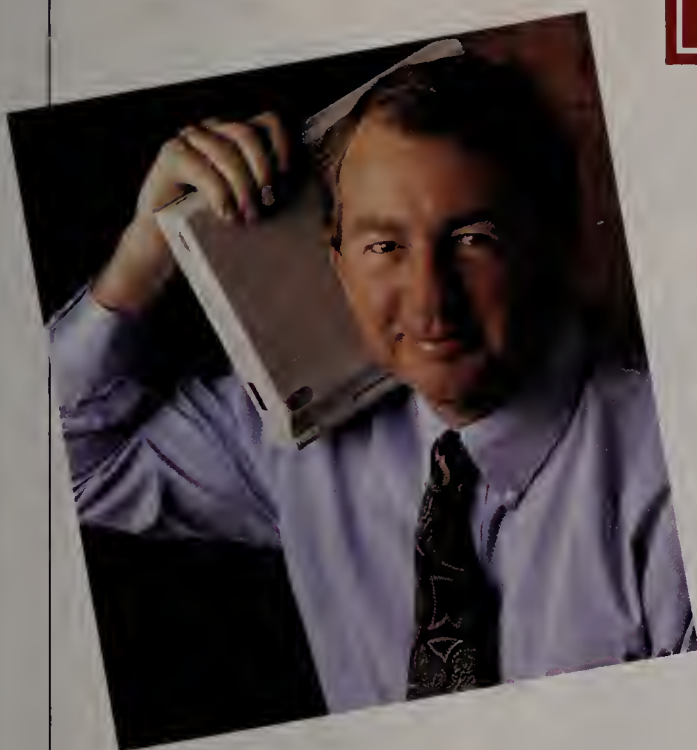
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CIO

VOLUME 8, NUMBER 11



Live and learn 44
Cover photo by Patricia Barry Levy

COVER STORY

EXECUTIVE EDUCATION

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Higher Learning

Non-IS executives have to be able to make wise technology decisions. But most senior executives would rather learn from just about anybody but the IS group. So what can CIOs do to help? Understand how business executives learn, provide them with the appropriate tools and expose them to educational forums that reflect their business focus.

By E.B. Baatz

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WEBMASTER: DOING BUSINESS ONLINE

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Not-So-Easy Payment Plans

What stands between sluggish Internet commerce and that much-predicted bonanza could be a good, safe way to lay your money down.

By Fred Hapgood

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moola
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THE GLOBAL ENTERPRISE

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They Reign in Spain

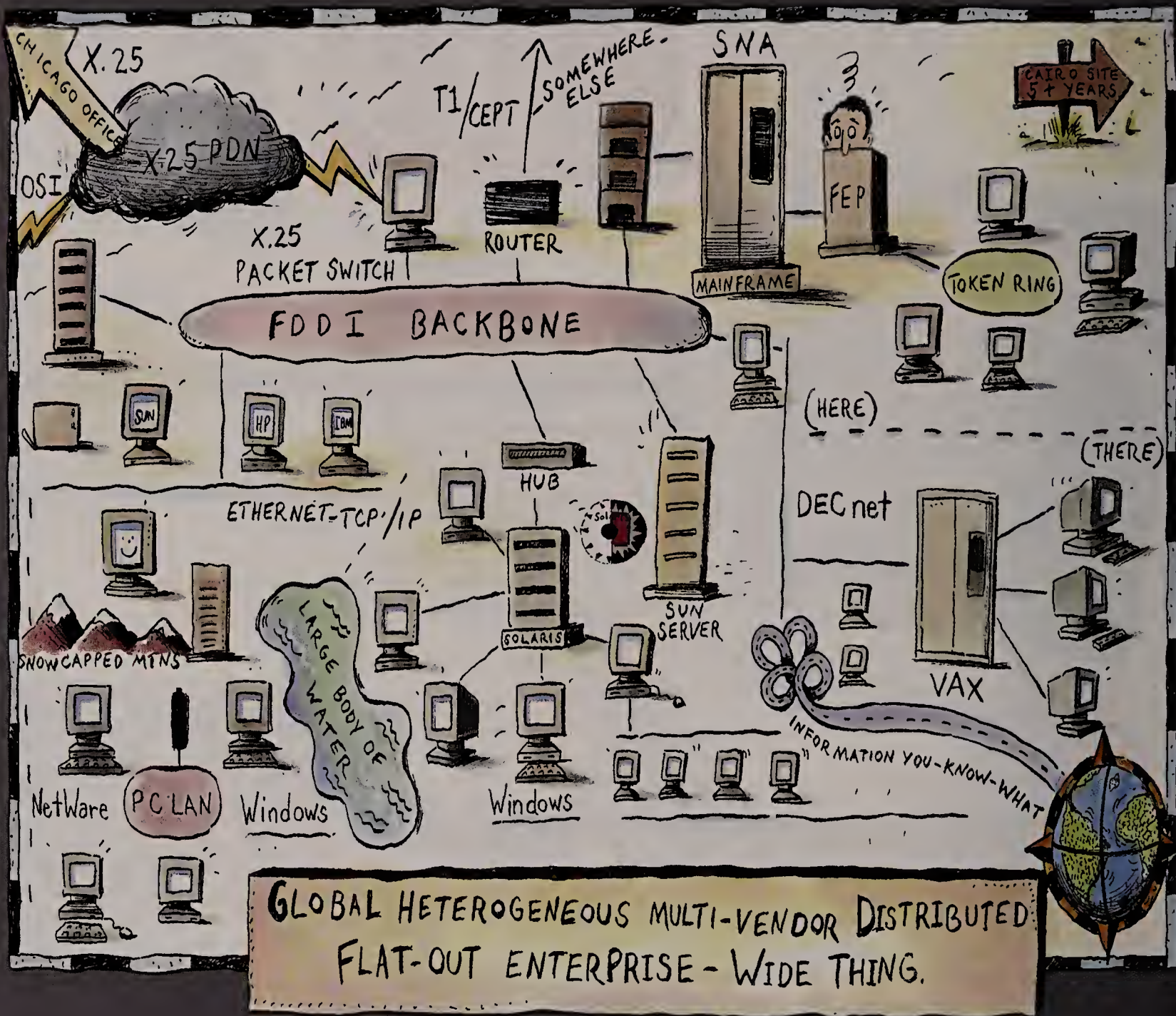
Taking a home-grown business overseas and developing new products in a foreign environment are tough challenges. Hewlett-Packard is succeeding at both in Spain through a shrewd choice of location, innovative management and the skillful use of IT.

By Gary Abramson

*Catalan
challenge
54*



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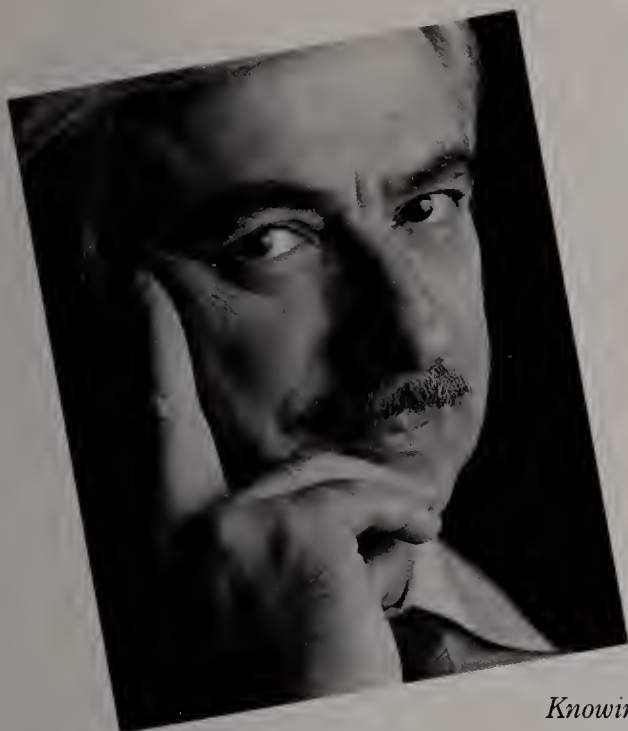
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Knowing
your stuff 62

FEATURES (CONT.)

INTERVIEW: STAN DAVIS

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The Importance of Getting Smart

Information is out. Knowledge is in. And Stan Davis thinks the education system needs to smarten up if companies are to prosper in a knowledge-based economy.

By Richard Pastore

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REPORTER'S NOTEBOOK: SURVIVAL STRATEGIES

Making IT investments pay off—the subject of CIO's recent ROIT Executive Retreat—depends on understanding the strategic value of applications and forging strong partnerships between IS and management.

By Abbie Lundberg

THE RAT RACE

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CIO LIGHT: MEET STANKY...

Observe the sharp rodentine teeth and darting eyes. To know him is to feel a shiver of dread. He is a corporate archetype, and if you let him, he'll snack on your tender career.

By Stanley Bing



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Information executives often express frustration with senior management's attitudes toward IT. Sometimes these business executives seem to be afraid of the technology or consider it beneath them to learn about information systems.

In this issue, Senior Writer E.B. Baatz reveals senior executives' preferences for delving into IT. First of all, top managers prefer to learn from their peers rather than from the CIO. And they prefer flexible tools for learning because time is a precious commodity. But the majority are most concerned about how IT affects the bottom line.

Our article profiles five executives—from IT aficionados to avowed technophobes. (Please see "Higher Learning," beginning on Page 44.) Some of these executives don't worry about making mistakes—it's OK to destroy some files and get one's hands dirty. Others find comfort in numbers, participating in peer groups that discuss IT issues and learn about emerging technologies. Executives also report they spend a good amount of time reading about technology.

However, it appears that some top managers would like to rely more on their information czars. They exhort information executives to share more information about IT advances and, as one top manager pleads, to not be so intimidating.

In "The Importance of Getting Smart," beginning on Page 62, Senior Editor Richard Pastore interviews Stan Davis about the necessity of exploiting knowledge within the organization and in the marketplace. Davis, the author of *Future Perfect* and *2020 Vision*, believes it is the CIO's responsibility to get people in the enterprise to understand the difference between information and knowledge. He also contends that the private sector will have to fill the gaps left by the inadequacies of U.S. public schools. In his new book, *The Monster Under The Bed* (written with Jim Botkin), Davis cites the technophobia and bureaucratic vision of the public education system as major impediments to knowledge.

Finally, keeping to our international editorial agenda, we feature an article on how Hewlett-Packard's printer division is faring in Barcelona, Spain. The article shows how HP successfully adapted its distinctive culture and is using its far-flung computer networks to create a nonhierarchical structure designed to break down barriers and encourage teamwork. (Please see "They Reign in Spain," beginning on Page 54.)

As in each issue of *CIO*, we strive to provide information executives with food for thought—whether the menu features new-technology implementation, management issues or global operations.

Marcia Blumenthal



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Editorial Offices CIO Communications, Inc., 492 Old Connecticut Path, P.O. Box 9208, Framingham, Mass. 01701-9208 (508) 872-0080, FAX (508) 879-7784. Printed in the U.S.A.
Subscriber Services (800) 788-4605, FAX (508) 872-0618.
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History is a great teacher. Or at least, it ought to be. One of the key missed opportunities in the history of CIOs is their collective failure to have envisioned the business impact of the PC. If only information executives had foreseen the coming reality of interconnected desktops and distributed client/server architectures, they could have spared themselves a lot of the chaos they currently face.

A comparable watershed moment confronts CIOs today. The phenomenal growth of the Internet—and of the World Wide Web in particular—presents an opportunity that can either be seized or missed. We at *CIO*

are strong advocates of the idea that information executives must embrace the power of the Web in their organizations (see our Dec. 1, 1994, issue, “A CIO’s Guide to the Information Highway”).

Consequently, I would like to call to your attention our feature on Page 34 (“Not-So-Easy Payment Plans”). It surveys recent technology advances in the methods of paying for goods and services over the Net. Look for the “Webmaster” label on this story, and watch for similar coverage in future issues of *CIO*. Don’t let history repeat itself—or you could be history.

Wayne L. Wray

P.S. Plan early! Make your conference reservation for the CIO European Symposium, to be held June 7-9 in Brussels, Belgium. This international forum will give you the opportunity to explore and evaluate global IT management issues. For more information, please call 800 355-0246.

Coming In CIO

Foreign Relations

Working for foreign corporate owners accustomed to different markets, cultures, work styles, organizational structures and business practices can present a multitude of challenges for the American executive. As foreign companies increasingly acquire, merge or partner with U.S. firms, those headaches could continue to grow as well. *CIO* will talk to organizations making long-term efforts to address these issues.

Systems on a Shoestring

Information-technology groups in nonprofit organizations generally have smaller budgets and must make do with less than their counterparts in the corporate world. We’ll profile three examples of such organizations to learn what they’re doing to succeed.

Bandwidth Blues

Many companies today are under increasing pressure to upgrade their networks in order to accommodate the needs of bandwidth-hungry applications such as imaging, groupware and EDI. What’s a CIO to do? Some have already taken action, but for most corporations, today’s requirement is to get ready for tomorrow’s needs. It’s time to think, plan and learn about the technological options.



A wing and no prayer.

To keep up with the accelerating pace of change, organizations are being forced to reshape themselves.

But unless improvements impact all areas of the enterprise, the race may be over before it starts.

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that don't transform are likely to end up in the soup.

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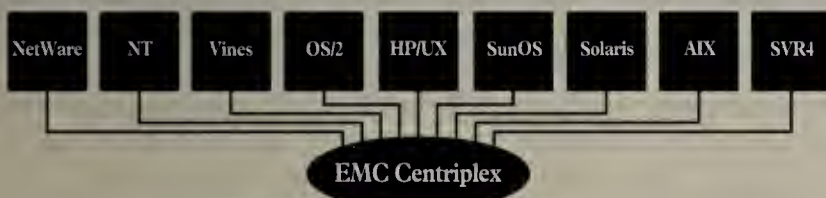
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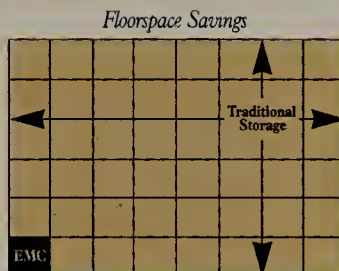


share. 6. For instance, by storing their information in central locations, companies are moving, managing and controlling their information more efficiently than before, and getting their products to market faster. 7. The Gartner Group reports that roughly half of machine-readable data now reside on desktops. How well your company uses, leverages

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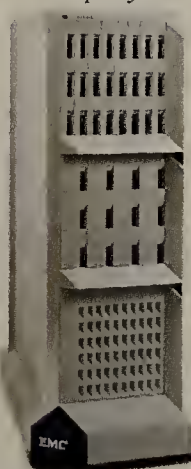
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15. Without compatibility problems. 16. Our systems get information into employees' hands faster than ever before, allowing them to use that information to make your company more successful. 17. Our

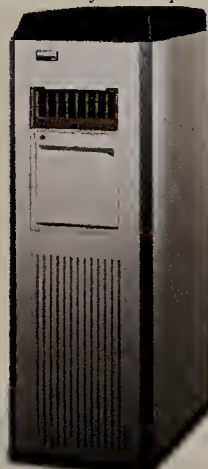
systems not only provide faster access, they ensure that the information is secure, and always available. 18. Case in point: Symmetrix,

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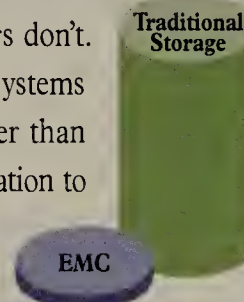


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COST-CUTTING STRATEGIES

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The need to reduce costs is shared by just about every organization today, and for many, that means some combination of budget cuts, layoffs and reengineering. Yet some companies are deriving significant savings without undertaking any of these. Their secret? A good accountant—and sometimes a tax lawyer.

According to Michael Lippman, a national partner at the big-six accounting firm KPMG Peat Marwick in Washington, the idea is to educate state tax assessors about changing technology—or make your point by taking them to court. All states impose personal property taxes, and most require that those taxes be applied to the fair market value of equipment and “intangible properties” such as databases and software. Therein lies the potential savings. Once a technology becomes obsolete—which happens with ever-increasing speed these days—its value falls drastically, meaning that the state tax bill can also be reduced.

For example, KPMG worked with one large

telecommunications company that shaved \$100,000 off its taxes by reassessing the useful life and tax implications of old technologies.

It's not just a matter of reassessing value, however. Once that's done, “the taxpayer has the burden of proving what the ‘fair value’ is,” says Lippman.

IBM Credit Corp., in

Stamford, Conn., has been highly successful in litigating the issue. “We're a leasing company,” says John Liik, manager of state and local operations, “so the customer pays the taxes on the equipment.” The motivation, then, has been to save customers money. Toward that end, the mere announcement of new and better technology was

enough to win a case in Colorado. In IBM Credit Corporation vs. Jefferson County, the state supreme court ruled that valuation should be reduced based on reports in two publications of a drop in used-computer prices following the announcement of the new technology. One of the publications, *Computer Price Guide*, was presented in court as the equivalent of the “blue book” used to value cars.

“We don't just litigate, however,” explains Liik. “We also will just go into the state tax assessor's office and educate them” about functional obsolescence in the technology industry. The more the company educates, says Liik, the less often it ends up in court.

—E.B. Baatz



A SIGHT FOR MORE EYES

E-mail can be a powerful communication tool, but anyone who has used it knows that the absence of nonverbal cues—gestures, facial expressions and so on—can sometimes make it disconcerting. For those who want to see who they're talking to, there's now an easy way to videoconference over the Internet.

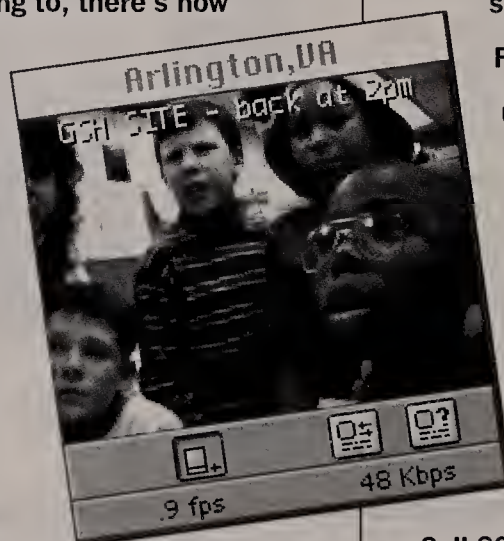
Using any video camera, a video frame grabber and CU-SeeMe videoconferencing software, developed by Cornell University, Netizens

around the world can communicate face-to-face. CU-SeeMe was first used to link classrooms nationwide and over-

seas in a National Science Foundation project to demonstrate the use of the Internet in K-12 education. Today, universities, corporations and governments are using it as well.

The software is available as free-ware on the Internet. In addition, Digital Vision Inc. of Dedham, Mass., offers it in a package that includes all necessary equipment.

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TRENDLINES

WHERE CITIZENS ARE SELF-TORT

Call them automated lawyer machines. The Arizona court system is now using interactive kiosks similar to automated teller machines to give citizens free information on alternative dispute resolution, small-claims litigation and other court ser-



vices, as well as to help them fill out basic legal documents such as divorce papers and eviction notices. The system, called QuickCourt, is designed to dispense routine information and produce complete legal documents, thereby alleviating demands on court staff.

The multimedia machines

feature an onscreen narrator who gives advice in English and Spanish. When assisting with document preparation, the system asks a series of questions that users answer by touching the appropriate responses onscreen. After the questions are answered, the kiosk prints a completed form. The machine doesn't decide cases, however; litigants must still file the papers in a real court and make their case before a real judge.

QuickCourt was developed by the Arizona Supreme Court's Administrative Office of the Courts with the state's Superior Court system and North Communications of Santa Monica, Calif. Currently, three kiosks are deployed at two courthouses in the Phoenix area and another in Tucson. The system won a \$100,000 Ford Foundation grant for innovative government; the developers will use the money to beef up services and deploy more kiosks. ■

HIGH-TECH MANUFACTURING

THE WAYS OF THE WORLD

Global competition is one of the biggest challenges facing U.S. companies today, and nowhere is that more true than in high-tech and electronics manufacturing. Threats from competitors in Japan and elsewhere are enough to rob even the most confident executive of sleep. And rightly so: According to a recent study by Deloitte & Touche LLP, U.S.

manufacturers have a relatively poor understanding of global competitors' abilities and strategies.

Issues of technological leadership, quality and customer service will need to be taken seriously by U.S. firms if they hope to avoid being left in the dust by the Japanese, according to Deloitte & Touche. In "Vision in Manufacturing: Planning for the Future," the Wilton, Conn.-based management consultancy presents the findings of its study, which it conducted in partnership with the University of North Carolina's Kenan-Flagler Business

School. A total of 1,300 manufacturing executives in 11 industrialized countries participated in the study, which covers critical areas of global competitiveness in the manufacturing industry.

Among the findings was that one of the biggest advantages U.S. firms currently have over Japanese competitors is the fact that they typically invest far more in innovative information systems than Asian companies do. But that's not enough, the study cautions: The challenge now is to integrate information systems both internally across functions and externally across supply-chain partners. This is the biggest opportunity for U.S.

high-tech manufacturers to succeed in the global marketplace, according to the study. By embracing PC- and LAN-based systems that enable this type of integration, U.S. manufacturers can stay ahead of Japanese firms, many of which are still in the planning stages for these technologies.

"The United States is at a crossroads right now," says Darvis Cormier, national director

of high technology and electronics industry consulting for the management-consulting division of Deloitte & Touche in Dallas. "We must take advantage of our knowledge and use of IT systems to upgrade quickly and bolster our global competitiveness against Japanese com-

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After months of fruitless searching we have finally found it—an IT angle to the O.J. Simpson trial! According to *The New York Times*, the jurors are wearing bar-coded tags. We don't know what the bar codes are for and, frankly, we don't care. It's just great to feel that we're somehow part of it all.

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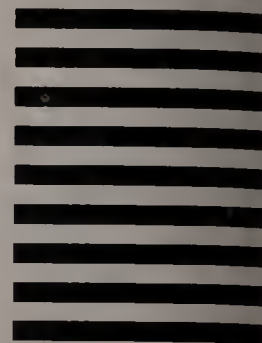
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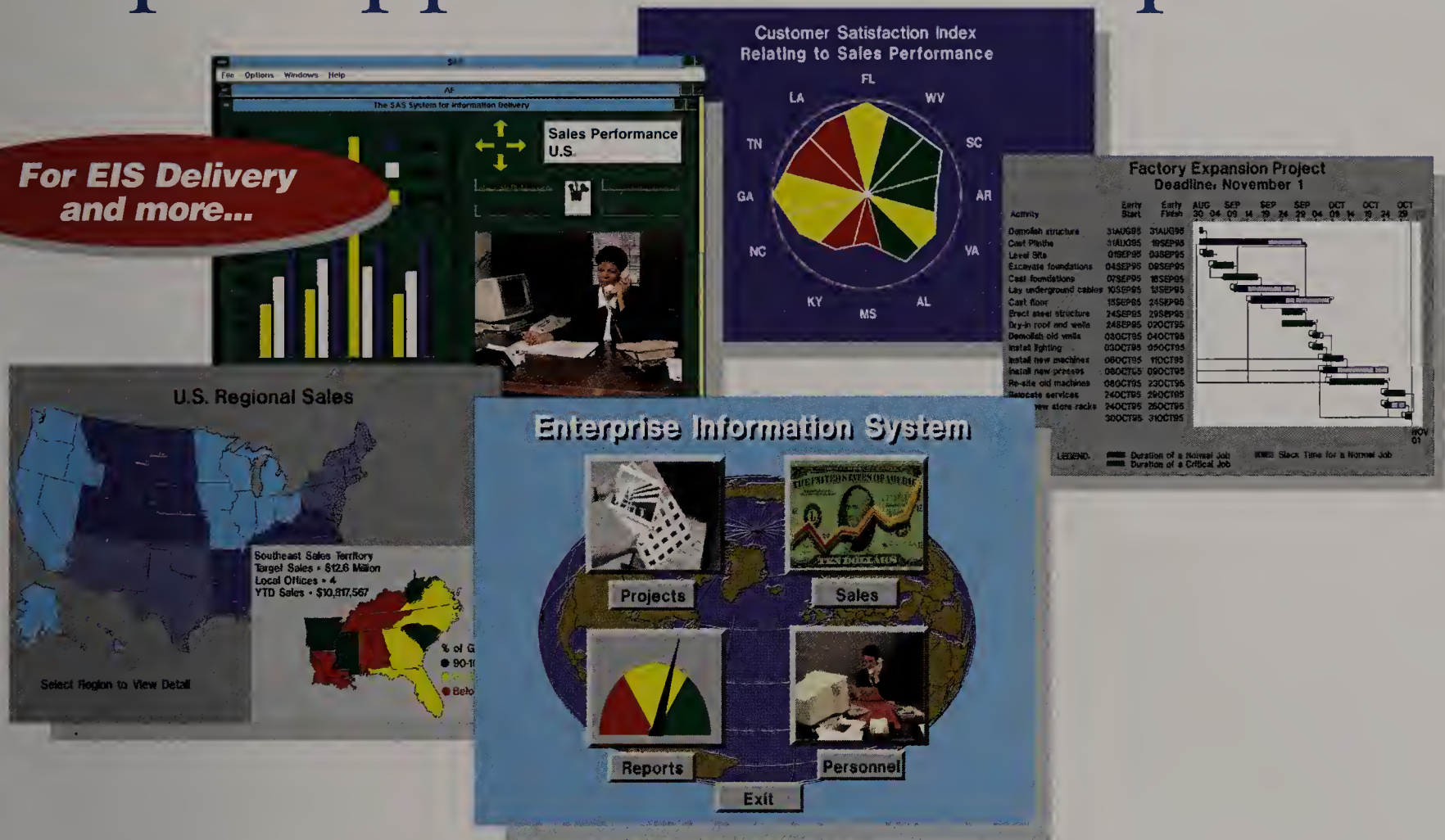
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panies." The good news for North American manufacturers, he adds, is that Japanese companies are subject to a long tradition of "people-intensive" manual systems that could slow their rate of adoption and success.

Yet while U.S. firms are well-situated with respect to information systems, they are being left behind in other areas critical to global competition, such as quality and customer service.

"With a few notable exceptions," Cormier explains, "North American high-tech manufacturers are placing their focus on customers' perception of quality by

offering bells and whistles rather than the inherent future market drivers such as product features, serviceability and aesthetics."

One important area for the future, suggests Cormier, is investment in human systems: training and retraining of employees as business processes change. "There is no doubt that markets will be turbulent and unpredictable in the future," he says. "It will require employees who can handle and maximize the technology available to tomorrow's manufacturers."

Call 203 761-3000 for more information.

—Brooke R. Burton

NEW INKLINGS

There are many things that worry CIOs about the information highway, but security is by far the greatest source of anxiety (see "Things That Go Bump On the Net," *CIO*, Dec. 1, 1994). When companies use e-mail for business communications, any sort of security breach can mean disaster.

Pretty Good Privacy (PGP), a software package commonly available as free-ware for most systems, can help allay those fears. Using signatures and encryption of both messages and stored files, PGP gives organiza-

tions a tool for ensuring the security of their e-mail communications and files.

William Stallings' *Protect Your Privacy: A Guide for PGP Users* (Prentice Hall, 1995) can help firms make the most of the software. Stallings explains how to send and receive PGP messages, how to deal with the options in encryption-key management and how to use PGP for personal file security, as well as "all the cryptographic concepts a general user needs to know."

For more information, call 800 947-7700. ■

A ROOM WITH A BREW

Some might say that "virtual reality" is what you experience as a result of drinking beer, but a new display in Sapporo Beer of Japan's Tokyo brewery uses VR technology to give visitors an up-close, inside look at the brewing process.

The Virtual Brewery offers 1,000 visitors a day a 5-minute virtual tour of beer making. Using virtual-reality viewing stations that feature 3-D sound, they can "fly" into the brewery control room and then explore the brewing, fermentation, filtering and bottling stages of the brewing process. Each portion is designed to illustrate the equipment and science involved in brewing: In the fermentation stage, for example, viewers enter the brewing tank where yeast is added to liquid "pre-beer." By flying around the space, viewers see up close the molecular struc-

ture of beer and its components.

The virtual-reality viewing stations are from Fakespace Inc. of Menlo Park, Calif., which worked with Telepresence Research Inc. of Portola Valley to develop the setup. In addition to the Virtual Brewery, Fakespace's technology is being used in scientific research, computer-aided design, training and other entertainment applications.

Call 415 688-1940. ■



EDUCATIONAL SYSTEMS

IT is playing an increasing role in higher education, both to enhance learning and to improve administration, and a recent study reveals precisely where and how.

In its Institution Database 1994 Profile, CAUSE, a Boulder, Colo.-based nonprofit association dedicated to enhancing the delivery of higher education through IT, profiles technology's role in a variety of academic institutions. The 435 colleges and universities surveyed range from research institutions to two-year colleges, and their responses span nine categories of data relating to their IT environments.

Among the findings:

■ 65 percent of the institutions surveyed have a strate-

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gic plan for IT

- 75 percent have an individual functioning as a CIO, though that person is only recognized as such at 56 percent of the institutions
- 75 percent have no chargeback system in place for academic computing
- 86 percent are connected to the Internet (up from 68 percent the year before)
- 59 percent have no policy in place to provide an ongoing budget for replacing PCs and workstations
- 57 percent are involved in long-distance learning

The 170-page report also presents data on myriad other issues, both in aggregate form and by type of institution. Contact CAUSE at 303 939-0310 or orders@cause.colorado.edu.

CORRECTIONS

Our Feb. 1, 1995, cover story, "Beneath the Big Dig," contained an incomplete reference to the animation engine used in Boston's Central Artery Project. Walkthru is a trademarked product of Bechtel Corp., one of the partners in the consortium managing the project.

Also in that issue, an item in "Trendlines" gave an incorrect location and telephone number for the HLA Registry. Headquartered in River Edge, N.J., the HLA Registry can be reached at 800 336-3363.

OFF THE SHELF

FUTUREWORK

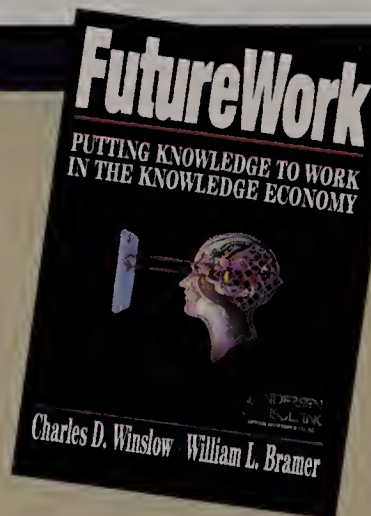
PUTTING KNOWLEDGE TO WORK IN THE KNOWLEDGE ECONOMY

By Charles D. Winslow and William L. Bramer
The Free Press (a division of Macmillan Inc.)
(New York), 1994
384 pages, \$29.95

It's a well-known fact that while consultants are seldom the creators of breakthrough business thinking, they are generally among the most enthusiastic bandwagon hoppers once a new business imperative has moved beyond buzzword and into the realm of potential money-maker. Reengineering is an obvious case in point—witness the battalions eagerly dispensing wisdom "critical" to making it work.

So it is with knowledge management. Thinkers such as Peter Drucker have been saying for years that the basic economic resource of the information age will not be land, labor or capital, but rather knowledge, and the companies that most effectively use it will be the ones to prosper. Now that this idea is moving beyond futuristic simmer to mainstream percolation, it has gathered enough critical mass to spawn consultant-authored books on the subject. *FutureWork*, by Andersen Consulting's Charles D. Winslow and William L. Bramer, is a recent example.

In *FutureWork*, Winslow and Bramer introduce the concept of Integrated Performance Support (IPS),



Andersen's take on how to manage corporate knowledge. Briefly, IPS is a strategy to help companies succeed in the knowledge economy by using knowledge workers to translate business information into competitive knowledge and, thus, profitability. In this economy, the authors contend, "productivity of knowledge workers is the primary performance imperative." IPS, they say, meets that imperative by creating "performance systems" that support knowledge-worker performance.

Not surprising, considering the source, the book has a decided technological slant to its implementation tactics. In discussions of the components of IPS, the word "system" nearly always refers to that of the technical rather than sociological ilk. For example, Winslow and Bramer rightly point out that companies must support workforce learning as a first step in translating data into knowledge. But while a human-resources-oriented book might suggest that a system of human interaction is important to the learning process, *FutureWork* concentrates on technological solutions such as the "Ask System," an interactive re-

search tool that lets workers simulate conversation with experts.

This techno-bias provides IT-oriented readers with a reassuringly familiar environment in which to explore the softer behavioral and cultural issues also involved in creating a knowledge-based company. However, this narrow focus also proves to be the biggest problem with the book.

Many knowledge-management experts point out that much corporate knowledge resides in human brains rather than computer systems, and that transferring it to a database robs it of the intangible spark created when two humans learn from each other. Readers would do well to remember what VeriFone Inc. CEO Hatim Tyabji says about knowledge management: "It's 5 percent technology and 95 percent psychology." Winslow and Bramer seem inclined to reverse that ratio.

That reservation aside, however, *FutureWork* thoroughly examines what it takes to build a performance system, providing a wealth of examples of firms that have already started down the knowledge-management road. Although it does espouse IPS to the perhaps too-ferveat exclusion of non-Andersen ideas, it's a good starting point for curious IT executives. If you intend to use *FutureWork* as your map, however, don't forget to bring along a psychologist to help translate technology into humanity.

—Carol Hildebrand

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Survival Strategies

Making IT investments pay off—the subject of CIO's recent ROIT Executive Retreat—depends on understanding the strategic value of applications and forging strong partnerships between IS and management

BY ABBIE LUNDBERG

Information services is “a field of implementation,” according to Harvard Business School's F. Warren McFarlan. “Deciding what to do is only 15 percent of the CIO's job; the rest is managing the transformation.”

McFarlan, who is senior associate dean, director of research and Ross Graham Walker professor of business administration at Harvard Business School, was speaker, facilitator and master of ceremonies at CIO Communications' January ROIT (Return on Investment from Information Technology) Executive Retreat at the Arizona Biltmore in Phoenix. He opened the conference by citing Michael Hammer's dire pronouncement that 50 to 70 percent of all business-process reengineering efforts have failed. As dismaying as that statistic may be, it's really not all that surprising given the context in which such efforts are taking place.

First, there is the progress in the technology: Cost performance has improved by an order of magnitude over the last five years, with an addi-

tional 35 to 50 percent improvement expected *per year* over the next 10, according to McFarlan. At the same time, the types of applications being developed are changing radically to reflect the trend toward interorganizational strategic partnerships as well as changes in the IT infrastructure itself (in particular, client/server and the growing ascendance of the network).

In this condition of flux, business leaders looking for guarantees of financial payback are inevitably going to be disappointed. “In the end, there isn't a clear objectivity,” said McFarlan. “Everyone wants clear ROI projections, but the most we can have in this arena today is a strong belief that the payback will be there.”

The key to getting through the next decade alive is to master the process of change management and build an internal partnership among senior, IS and middle management. “There, bitterly, is where the genius and action lie today,” said McFarlan. (The bitterness, presumably, comes from the fact that in too many organizations, IS is viewed with little more than contempt.) The most important thing CIOs can do to keep costs under control is to develop corporatewide standards, which McFarlan stressed repeatedly. Referring to the Gartner Group's \$10,000 estimate for the cost per year per desktop of client/server computing, McFarlan said that “comes from a lack of standards.”

The ROIT Executive Retreat is a forum for exploring how IS executives can deliver strategic value to their organizations through the use of information technology. But what

F. WARREN McFARLAN: *If a company's systems are strategic, the CIO had better be sitting at the table with top management.*





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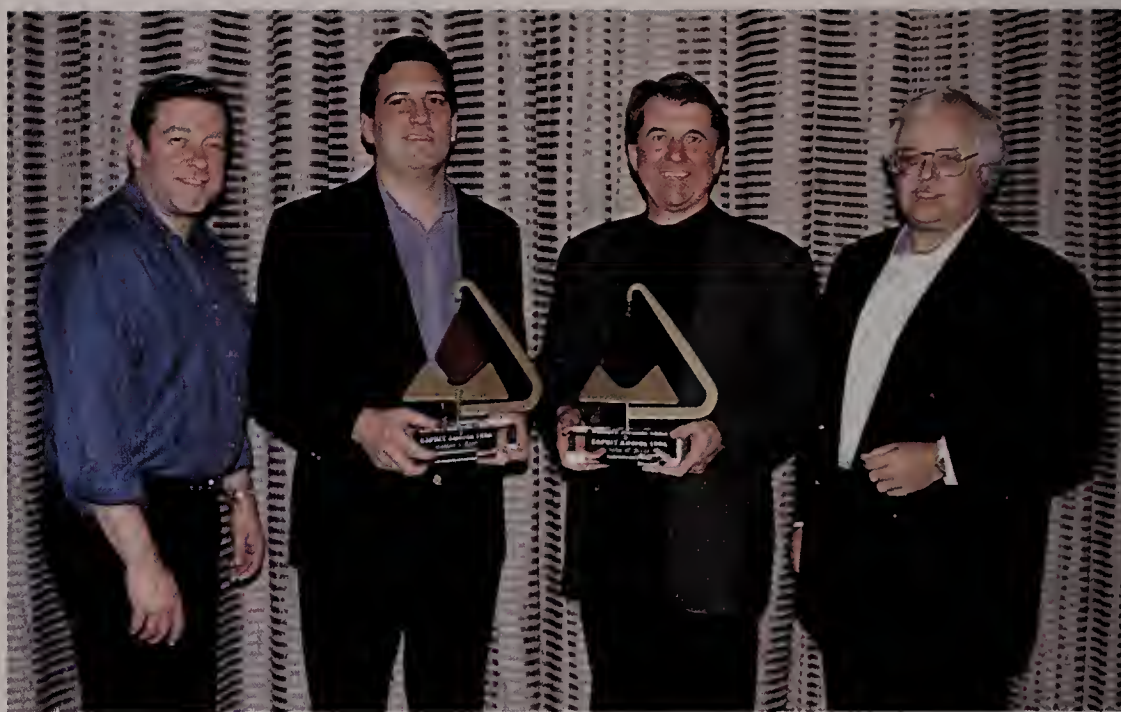
CIO

constitutes strategic value in one company may be irrelevant in another. According to McFarlan, the role of any given IS organization depends on the nature of its applications. He cited the classic grid shown below (first published in "The Information Archipelago—Plotting a Course," by McFarlan, James L. McKenney and Philip Pyburn, *Harvard Business Review*, January/February 1983) as a way to assess a company's dependence on its existing systems (how long can the network be down before the business is damaged?), as well as the strategic impact of its application-development portfolio (are applications under development likely to deliver a strategic edge?).

McFarlan contends that every organization fits into one of the following four quadrants.

Support: Companies (or operations within companies) that fall into the support quadrant are not dependent on their systems being up and don't look to their systems for strategic differentiation (for illustration, McFarlan cited a water company in the United Kingdom that bills customers once a year based on property values rather than usage). IS is a lower-level function; the IS executive has little contact with senior management. These systems are good candidates for IS outsourcing.

Factory: Systems that must have near-perfect reliability (can afford to be down no more than 45 minutes a year) but that aren't a major engine of innovation fall into this quadrant. This includes many airline-reserva-



DAN AMEDRO and JOHN BIGGS (center) accept an ESPRIT Award from Marty Silverman (left) of Booz-Allen & Hamilton and CIO Publisher Joe Levy (right) on behalf of Hyatt Hotels Corp., one of six ESPRIT Award recipients honored at the conference.

tions and bank-transactional systems. This is not the quadrant for taking risks. These systems can also be considered for outsourcing with a dependable third party.

Turnaround: This quadrant doesn't depend on systems being up all the time, but the company's survival depends on the strategic impact of its application-development portfolio (its IS applications are on "the short list of the four or five things the company has to do right"). For example, a pharmaceuticals company whose strategic application slashed time to market (normally about nine years) by 18 months could survive a three-day system crash. Because these systems are strategic, the CIO had better be sitting at the table with top management. Such systems can only be developed in-house.

Strategic: According to McFarlan, 40 percent of companies fall into this quadrant, and for them, "IT is a really big transforming deal—they have an excruciating dependence on this technology." For instance, a bank that gained market share by pioneering ATMs also cannot afford to have its network go down. System uptime must be near

perfect, and application development is critical to the organization's success. In this quadrant most of all, IS should be closely linked to the top decision making, and outsourcing is not a viable option.

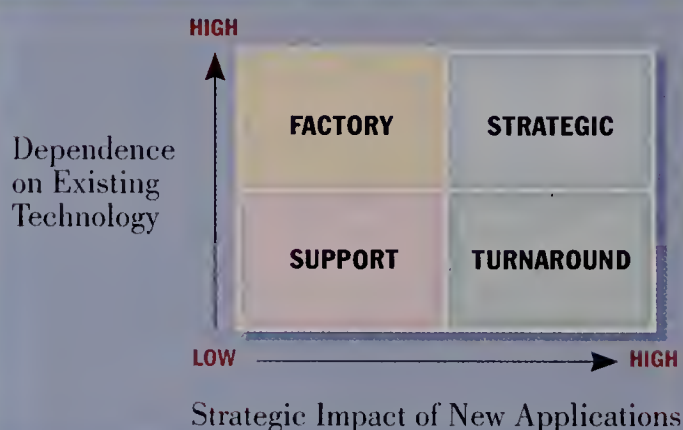
"Companies in the strategic quadrant must pay up for leading-edge technology," McFarlan said. "And understand that if you're out on the edge, you're going to get blown out of the water sometimes. You're not

The most important thing CIOs can do to keep costs under control is to develop corporatewide standards.

going to win them all. In fact, you may need to worry that you're not taking enough risk. On the other hand, the support quadrant is a lousy place to be throwing the dice."

Understanding where your company lies on the grid is important, McFarlan told conference participants. The differences in CIO standing, reporting structures and salaries stem from "more than just management orneriness and capriciousness,"

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ROIT REPRISÉ: *Survival depends on mastering the process of change management.*

he said. Rather, they reflect “where the organization intuitively feels it is” on the grid.

To drive home the importance of managing organizational transformation, McFarlan described one of the cases he uses in his classes at Harvard. It compares the experiences of two very similar insurance companies deploying the same financial-planning expert system to their sales forces. One was a resounding success, the other a dismal failure (three other companies deploying the same system also failed). What was different at the successful company, McFarlan said, was that it “understood that this was an organizational transformation [and that] everyone’s job would be turned inside out.”

While top-management sponsorship and the right technology are necessary, he explained, they alone are not sufficient. You also must have line-management leadership and a sound change-management process in place. “You have to get inside the heads of people at each level.”

It’s also important to take organizational memory into account—a bad past experience can overshadow the current project, even if the two systems are unrelated. And external drivers, such as new regulations or changing markets, can galvanize support. Finally, the effort should be con-

centrated: Use pilots and a phased rollout.

A case study of Air Products and Chemicals Inc. (APCI), an Allentown, Pa.-based manufacturer of specialty gases, chemicals, and environmental and energy products, offered an opportunity to put McFarlan’s theory into practice. Participants

**According to McFarlan,
a CIO’s background is
irrelevant in the ’90s.**

**What matters is the ability
to develop crucial symbiotic
relationships with the
right people.**

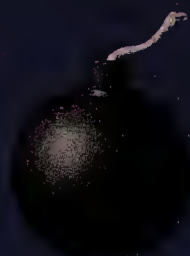
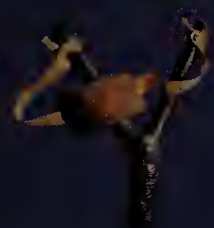
broke up into groups of seven or eight people to evaluate the company’s situation and come up with recommendations for moving into the future. Some groups found it difficult to advance beyond particular issues, such as the soundness of the move to client/server (a moot point, many people noted, since the horse was

already out of the barn). But overall, the level of work done by the groups—particularly in composite—was remarkable. They looked at the division of roles between central and divisional IS, managing the growth and proliferation of client/server, the importance of evaluating outsourcing opportunities on a project-by-project basis, the need for standards, the importance of managing expectations and setting up cost-tracking models, as well as training/retention issues.

After four groups presented their conclusions, the two APCI executives who had offered themselves up for dissection—Bob Lovett, executive vice president of strategic planning and technology, and Pete Mather, vice president of MIS—thanked the audience for its input and outlined the company’s plans for the future. The two disagreed over whether the next CIO should have a technical background (Mather said yea; Lovett nay).

According to McFarlan, a CIO’s background is irrelevant in the ’90s. “What matters is the ability to develop crucial symbiotic relationships” with the right people. The technically oriented CIO must create “an in-depth partnership with management [by building] a network of relationships to link into the very heart of the firm.” The nontechnical CIO must make sure he or she has key technical people in place at the next level down.

McFarlan’s final piece of advice to the CIOs in the audience was to do their utmost to make sure their CEOs and other senior executives know how hard this stuff really is—that even the biggest, most resource-rich IT organizations trip up sometimes. To do this, he said, make sure executives know about the doubts that Windows ’95 will actually make it out before the end of the year. Make sure they know about Intel’s Pentium problems. With no way to guarantee the payoff we’re all hoping for, everyone’s going to experience failure at one time or another. Sadly, this is one of the cold realities that many general managers simply do not understand. **CIO**



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Not-So-Easy Payment Plans

What stands between
sluggish Internet
commerce and that
much-predicted
bonanza could be a
good, safe way to lay
your money down

BY FRED HAPGOOD

BY MOST METRICS, THE INTERNET IS THE KUDZU of technologies. The number of e-mail addresses doubles every year; the number of hosts every six months; the number of World Wide Web sites every three. The one sad exception to these curves is online sales. Online merchants report that sales are both slow (according to a survey done by *The Economist*, the average vendor makes one online sale a day, for a revenue stream of less than \$25,000 a year) and stagnant, at least relatively.

"Is it us, or is it the Internet community?" a disappointed marketer complained recently on a Usenet marketing newsgroup. "Maybe there's no one who's interested in computers and 'nerdy' enough to be on the Net who wants to buy anything."

Perhaps for this reason, many commercial Web sites don't even support order entry, concentrating instead on marketing and PR. This tentativeness is especially disappointing given the apparent potential of gathering all the world's buyers and sellers into the same handy mall. Some of the reasons suggested for this sluggishness are that Web surfers have tended to be college students and therefore

poor; Web shopping is more conveniently done at home, and most home computers still lack the muscle and connections needed for comfortable Web access; the lack of a central Internet authority leaves buyers feeling inse-

tion to the online environment. For instance, in theory, card numbers can be hacked out of Net traffic by software "sniffers"—programs that sit at traffic switches and test each packet as it passes to see if it contains a number. No



Some people want to see a form of digital money that leaves no track—something you can spend without the merchant knowing who you are or the issuing bank having any idea where you spent it or on what.

cure; and Web store interfaces are neither simple nor attractive enough to put most consumers in a buying mood.

No doubt these considerations have their weight, but in recent months a number of companies have bet on another culprit entirely: the credit card. Commerce on the Internet is currently conducted with credit cards. As useful as these instruments have been in physical malls, they may have developed cracks during the transi-

actual instance of such interception has been made public yet (though password sniffers have been uncovered), but what crooks can do, they sooner or later will do. This vulnerability is widely known and, the theory goes, is one reason why Net-commerce growth has been so laggard.

If credit cards are problematic for online commerce, what might improve upon them? A number of people want to see a form of digital money that leaves no track—something you can spend without the accepting mer-

How Jack and Jill Do Private Deals

.....
Defeating the dossier-builders is no simple matter

ADutch company called Digicash, based in Amsterdam, is developing an electronic-cash product that relies on an encryption scheme designed to safeguard the privacy of parties to an online transaction. Suppose a prospective buyer named Jack wants to purchase something from a vendor named Jill.

Using the Digicash model, Jack makes 100 files. In each file, he pastes a different random string of digits (eventually, these become the serial numbers the bank will use to identify which credits Jack has spent) and the denomination of the currency he wishes to buy. Jack then multiplies each string by a different random factor (to prevent the bank from recording the serial numbers at this point) and combines them into a single package. Finally, he encrypts the whole package

twice more, first with his private key (to authenticate the request), then with the bank's public key (to prevent interception). He sends the package to the bank.

The bank decrypts the package using its own private key and Jack's public key, selects 99 of the 100 files at random, and asks Jack's computers for the keys to those files (which have their own separate series of ID numbers). It decrypts all 99 and examines the face value of the requested credits in each. If the amount requested was the same in every case, the bank assumes the remaining request is also for that amount. It encrypts the last file—which, recall, is still encrypted with the random factor—with its own private key and Jack's public key and returns the package to Jack. Finally, it debits the requested amount of money from Jack's account.

Commerce on the Internet is currently conducted with credit cards. As useful as these instruments have been in physical malls, they may have developed cracks during the transition to the online environment.



chant necessarily knowing who you are and without the issuing bank having any idea where you spent it or on what.

Such a currency seems difficult to imagine, since a bank issuing it obviously needs to know whose account to debit and by how much as well as when a credit has been spent, so the bank won't keep redeeming the same credit. But there is a product under development that promises to answer this need: e-cash, by an Amsterdam-based company called Digicash (see related story, Page 36). Somewhat less-sophisticated solutions are now available offering advanced "double-key" encryption schemes that require not one key, like many codes, but two. They are designed such that the texts coded by one of the pair can only be decoded by the other.

In one typical routine, a buyer interested in a product would ask the vendor's computer to generate a pair of these keys. The vendor passes one to the buyer and keeps the other resident on his system. The buyer uses the distributed key to code his credit-card number and send the cipher back to the vendor, who then decodes the number with the other member of the pair. In a variant of this technology, the buyer's key request is sent to a bank or processing company, and it is this company, not the merchant, that generates the keys and does the decrypting.

A buyer can use the same technology to "sign" for orders: He generates the pair of keys and hangs one on a public server. Then he codes his name or order with his private key and mails the cipher to the vendor, who then retrieves his public key and checks to see if it decodes his file. Anything that can be decoded with a person's public key had to have been coded by his private key, and so is likely to be authentic (though it should be noted that no court has yet held digital signatures binding on a contract).

Companies offering or preparing these kinds of products include The NetMarket Co., of Cambridge, Mass., (www.netmarket.com); Hell's Kitchen Systems Inc., of Hoboken, N.J. (hauman@hks.net); CyberCash Inc., of Reston, Va. (www.cybercash.com); and Open Market Inc., also of Cambridge (www.openmarket.com). Further information about these companies, products and techniques can be found at CommerceNet (www.commerce.net/), an industry consortium working on financial-exchange standards and protocols.

Double-key encryption makes the transfer of credit-card numbers secure but has the disadvantage that the right software must be running on both the buyer's and the seller's computers before a sale can take place. A simpler approach is to "bundle" sellers into a group and set up a central office to handle credit-card services for the whole. An interested buyer registers his credit card just once with the central office, gets a group-specific account number back and thereafter uses that account number to buy from any seller who either is a member or is prepared

Jack decrypts the package with his private key and divides out the random factor, leaving the serial number encrypted only with the bank's private key. He then re-encrypts the file with his private key and encrypts it again with vendor Jill's public key and sends it to Jill.

Jill peels back the first level of encryption with her private key, the second level with Jack's public key and the third level with the bank's public key. Satisfied that the bank has authenticated the amount, she mails Jack his goods and takes the credit to the bank. The bank performs an authentication check the same way Jill did and records the credit as having been spent.

This system prevents the bank from using the serial numbers of the credits to amass a dossier of Jack's purchases. If Jack wants an even higher level of security, he can conduct his relations with Jill through an anonymous remailer, with the result that Jill will be unable to tell who Jack is.

It remains to be seen whether bankers in significant numbers will trust a system this complex; but it only takes one bank, anywhere in the world, to make the instrument real.

—F. Hapgood



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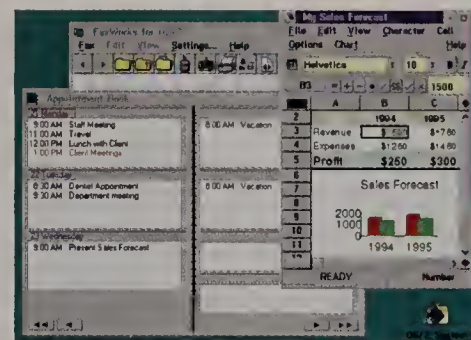
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to join on the spot. The First Virtual Holding Co. (FV), incorporated in Cheyenne, Wyo. (www.fv.com), offers just such a service.

First Virtual also addresses two other problems with Net commerce. Online companies often lack the usual attributes that banks and credit processors require in order to establish merchant accounts (those that allow the merchant to accept card charges). For instance,

pay for information, his or her First Virtual account may be subject to revocation," in the words of FV's published guidelines.)

One limitation of this system is that both buyers and sellers have to subscribe to the service before a transaction can take place. The sign-up procedure is intended to be both cheap (\$2 for buyers) and friendly enough to constitute a relatively low barrier (the regis-



Consumers are likely to have qualms about handing a negotiable token, encrypted or not, over to a merchant the buyer has never heard of before, who might have been in business for about a month, and whose physical location might be anywhere on the planet.

banks might require that vendors advertise in conventional media or that customers be able to speak to a representative during business hours. "Processors are leery about being approached by companies that meet no definition of any business they have ever encountered before," reports Charles Dye, who was denied an account for his music recordings business.

The only qualifications required of a First Virtual merchant are an ordinary checking account and a registration fee of \$10. In theory, such a service might expand the universe of Internet vendors significantly, perhaps thereby attracting more consumers. But expanding the vendor universe intensifies another problem: buyer wariness over the identity and integrity of vendors. Consumers are likely to have qualms about handing any negotiable token, encrypted or not, over to a merchant the buyer has never heard of before, who might have been in business for about a month, and whose physical location might be anywhere on the planet.

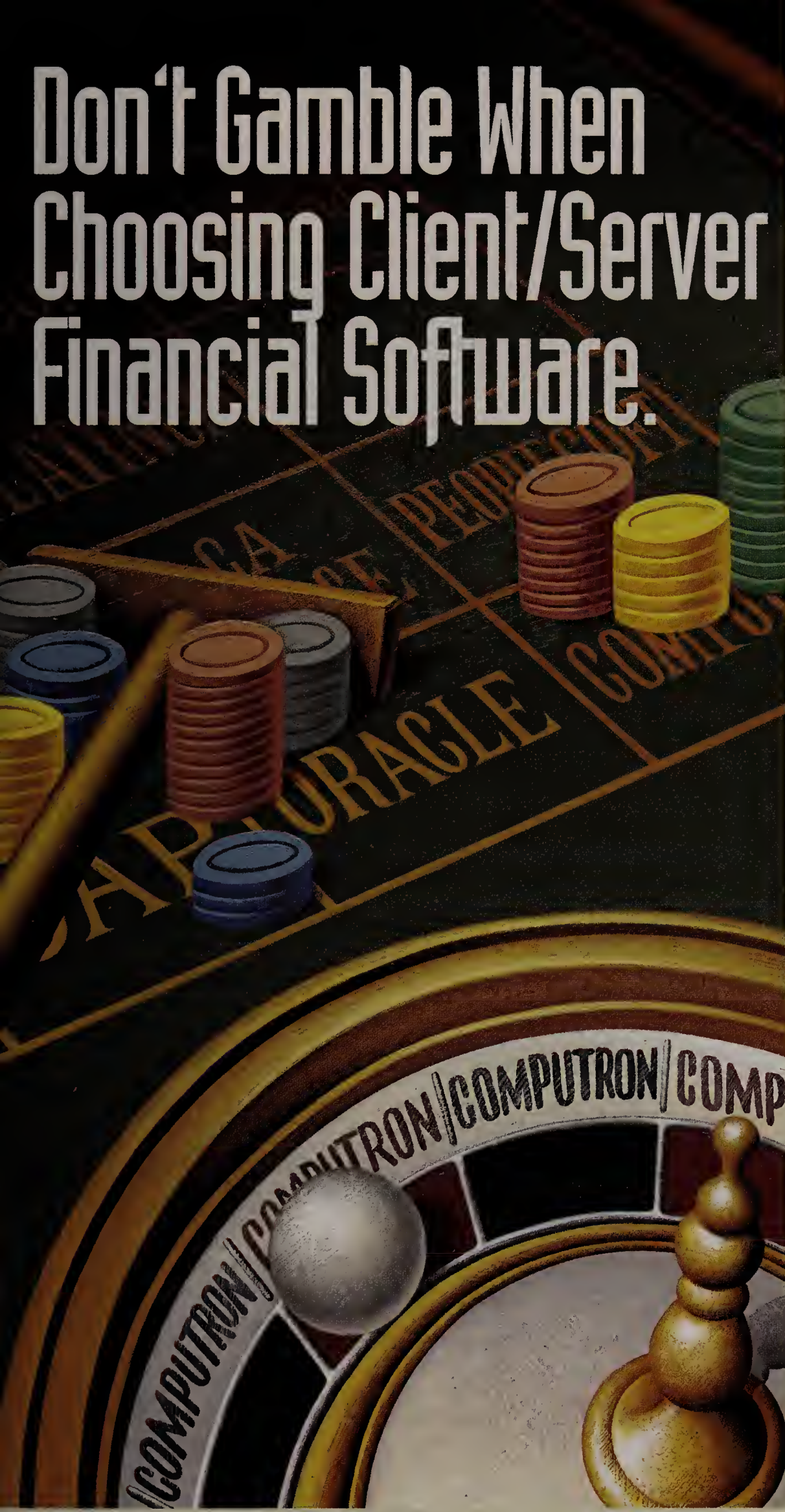
FV accommodates this concern by allowing customers to pay after they have had an opportunity to inspect the product. When the buyer wishes to make a purchase, he sends his FV account number to that merchant and downloads the product—a text file, data set, program, or audio, graphic or video file—on the spot. (In some cases, the merchant might block the download until the account is verified.) The seller then passes the account number on to FV, which e-mails the buyer to ask permission to debit his credit-card account. If the buyer feels the seller over-promised, he is allowed to refuse the authorization. (However, "if the InfoConsumer repeatedly declines to

tration process is mildly complex and requires a total duration of several hours for a buyer to become fully accredited). FV charges 2 percent of the sale amount plus 29 cents per transaction back to the merchant and requires merchants to wait 90 days for their money, a measure the company says is a defense against merchant fraud and might be relaxed in some cases. (Send a blank message to help@fv.com for more information.)

Some argue that the Internet is best adapted to products that sell at low prices and high volumes. The logic is that information products and services—which represent a large proportion of what's now trafficked over the Net—are easy to copy, and that low prices are the best defense against copying. Moreover, consumers are currently too inexperienced in and tentative about online commerce to want to spend large sums. Finally, the emerging market for semi-automated transactions, which can be carried out by machines and not directly by people, is best suited to the kinds of products (for example, processor cycles, bandwidth and small amounts of highly processed data) that can be sold to large numbers of "customers" at high speeds and low unit prices.

For these sorts of transactions, credit cards are a poor payment medium since they usually carry fairly high minimum transaction costs. A fee-per-access Web-site directory featuring cutting-edge searching tools might do far more business charging in dimes than in dollars; but that wouldn't be in the cards if it were forced to levy a 50-cent fee for every transaction just to pay for card verification.

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One ambitious alternative to the credit card that eliminates this problem is NetCash, sold by Software Agents Inc. (SA), of Germantown, Md. (send a blank message to info@agents.com for more information). NetCash is electronic money, like a digital cashier's check or money order. You fax SA a check with your Net address, and it will e-mail back a credit for the amount of the check. Whomever you give the credit to can return it to SA for a check. SA makes its money by charging a 2 percent conversion fee on both ends of the exchange, as with a foreign-currency transaction, plus a \$4 minimum check-writing fee. There are no transaction costs. Possible applications include marketing promotions; donations and contributions to shareware authors, sysops and online charities; and payment for goods and services. Perhaps artists will someday invite visitors to their Web sites and collect spare quarters of NetCash, like today's sidewalk performers.

The SA product has the advantage that the buyer can define his exposure to the last pen-

the company knows who bought a given credit and who turned it in. By contrast, a bank issuing paper cash never gets to know who touches that money or why.

The product being developed by Digicash (www.digicash.com/ or www.digicash.nl/) would assure consumers the same level of privacy as paper money. (See the related story for an explanation of how the Digicash protocol works; a fuller explanation can be found in Bruce Schneier's definitive *Applied Cryptography*, published by John Wiley, 1994).

This review of online financial mechanisms is a snapshot of a river in flood. Microsoft and Visa have announced a joint project to develop payments-security and customer-authentication software. Netscape Communications Corp., of Mountain View, Calif. (home.netscape.com), a communications software company, is working with the largest credit-card processor, First Data Corp., of Hackensack, N.J., to much the same end. Open Market is packaging a sophis-



Some argue that the Internet is best adapted to products that sell at low prices and high volumes. The logic is that information products and services are easy to copy, and that low prices are the best defense against copying.

ny, which is not always the case even with credit cards. On the other hand, a buyer who neglects to back up his hard disk acquires another vulnerability; if you lose your NetCash, it's gone as irretrievably as paper cash burned up in a fire. Another possible disadvantage is the risk from electronic counterfeiters: One could make a thousand copies of a NetCash credit and send them off to a thousand merchants. In that situation, the only vendor to get paid would be the first to return a copy of the credit to SA.

A natural response by merchants would be to hold onto their goods until the cash had been authenticated, though Software Agents believes that the nature of the niche (low-cost items) removes much of the incentive for this kind of fraud.

For many customers, a major disadvantage of credit cards is that they allow the compilation of detailed dossiers of a user's purchase history, down to the level of the actual item. NetCash does little to ease this anxiety, since

ticated range of payment services inside a toolkit of programs for online vendors; the programs are for building and managing online stores, supporting customer browsing and searching, and handling and verifying payments.

CyberCash founder William Melton, who also founded VeriFone Inc., the company known for proliferating credit-card authorization terminals in retail outlets, is upbeat about the future of cybersales. Says Bruce Wilson, Melton's partner in CyberCash, "We understand what's required because Bill Melton tamed the terminal world. Now we're going to tame cyberspace."

The current inadequacies of financial-exchange mechanisms might or might not prove to be what's ailing Net commerce. But for now, there are plenty of doctors in the operating room. **CIO**

Fred Hapgood is a Boston-based science and technology writer.

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Higher Learning

Non-IS executives have to be able to make wise technology decisions. But most senior executives would rather learn from just about anybody but the IS group. So what can CIOs do to help? Understand how business executives learn, provide them with the appropriate tools and expose them to educational forums that reflect their business focus.

BY E.B. BAATZ



Frustrated trying to teach the top dog new information-technology tricks? Give it up. Most senior executives—from the CEO on down—are and always have been experienced self-educators. These days, the corner-office contingent are tapping into their home PCs, discovering the ease of point-and-click software programs and reading more and more about IT and its business applications in *The Wall Street*

Journal and *Business Week*.

That's not to say that CIOs should ignore executive education. They can facilitate, listen and offer profit-oriented solutions. To that end, they must have a basic understanding of the executive learning process. While everyone learns differently, in-depth interviews with five senior non-IS executives reveal at least three common themes.

One, given the choice between learning about IT from their own functional peer group or from their company's CIO, senior executives clearly prefer to learn from their peers. Two, senior executives are extremely busy people, so they demand flexible tools and accommodating guides in order to fit learning into their hectic schedules. And three, no matter how much fun some executives are having learning new technologies, the majority are concerned about realizing returns on the company's investments in IT capital as well as maximizing returns on investments in their own executive human capital.

Here, then, is what five senior executives have to say about their IT education.



A HANDS-ON APPROACH

MANVILLE CORP., A BUILDING-products and packaging manufacturer based in Denver, has a most unusual chief executive. Chairman and CEO Tom Stephens, age 51, uses three computers, drafts his own letters and creates his own presentations on the PC. He says he considers working with new software as pleasurable an experience as reading a good book.

For Stephens, learning about software and computers to help him manage more effectively has always

been a priority, even in the old days of punch cards. Stephens joined OlinKraft Inc. (the predecessor to one of Manville's subsidiaries) as a co-op engineer in 1963, while earning his B.S. and M.S. in industrial engineering from the University of Arkansas. While many of his contemporaries were breaking into college presidents' offices to protest the war, Stephens was breaking into his new employer's computer room in order to work on a mathematical model he was building on pine trees. "I got caught...like a burglar," recalls Stephens. The next day, in response to the break-in, then-CFO John

EXECUTIVE PROFILE

Name: W.T. "Tom" Stephens, 51

Position: Chairman and chief executive officer for Manville Corp. in Denver

Formal education: B.S. and M.S. in industrial engineering from the University of Arkansas

IT tools I use now: Pentium PCs at home and in the office and a portable PC on the road

Next IT tool I plan to look into: Video communication on the PC

Last IT publication I read: Some over-the-counter publication, *PC Week* or something; I can't remember the name.

Most fun with computers lately: Playing *Myst* with my daughter in Nashville

Personal IT education philosophy: The best way to learn is to get your hands dirty, get on the PC, destroy a few files and don't be afraid to make mistakes.

Mullins told Stephens to expect a job change. Three weeks later, Stephens was the company's director of data processing.

To this day, Stephens considers Mullins to have been the most important "teacher" of information technology in his career. Why? Because he did not punish him for trying something new. Learning about IT, says Stephens, requires a willingness to make mistakes, to destroy a few files and to get one's hands dirty. When he runs into problems trying out a new piece of software, Stephens rarely calls for help from his company's IS department. "Why, you'd be a chicken to call someone," he quips. Like most busy executives, Stephens' biggest ongoing challenge is finding time for the IT learning process. "You have to be willing to sit in front of the keyboard," he says. Luckily, Stephens really enjoys tackling new software. "Some people play tennis," he says; "I play with spreadsheets."

Stephens worries a bit about how IT is being taught—or not taught—in the schools. "Traditional high schools and colleges are not doing the job, so the burden falls on the company," he says. And in most companies, this education is conducted in such an unstructured way that the learning occurs by happenstance.

Stephens focuses his own company's education process on getting IS executives to think more like line executives and getting businesspeople to think more like IS leaders, through classes and leading by example. "If I were going into business today, I'd set up my own university...modeled on the way IBM's education group operated in the early '70s," he says. "Then IBM taught the mechanics of computing as well as the power of using computers to manage business information."

IT education in corporate America may eventually take care of itself, however. "I watch my 11-year-old daughter growing up with her own computer," says Stephens. "Well, it's mind-boggling." With future technology-savvy CEOs in the pipeline, executives like Stephens will not remain an anomaly for long.



EXECUTIVE PROFILE

Name: Barry Weintrob, 58

Position: Chief financial officer for The Port Authority of New York and New Jersey

Formal education: B.S. from Cornell University, School of Industrial and Labor Relations, and M.B.A. from City University, Baruch College, in New York

IT tools I use now: 486-based PCs at home and in the office. I just stopped using my palmtop for personal scheduling and have shifted that function onto companywide software.

Next IT tool I am exploring: Groupware

Last IT publication I read: *CIO* magazine

Most fun with computers lately: PCs are my hobby. I like to wander around and explore. For example, I went to the library recently to look at the Internet. At home I explore via CompuServe.

Personal IT education philosophy: It is absolutely critical for me to keep learning. The biggest barrier is time management. Without the computer, I would be almost disabled in my thinking.

PEER TO PEER

THE CFO FOR THE PORT Authority of New York and New Jersey doesn't fit the stereotype of the technophobic senior executive either. Barry Weintrob, age 58, barely remembers the days before he began using a PC to help him schedule his appointments, do "what-if" scenarios on spreadsheets and communicate with his staff. "The Port Authority has encouraged its senior executives to learn about information technology by buying everyone in upper management a PC for home use," says Weintrob. "I'm too busy in the office to spend time learning [a new piece of software], so the learning process must take place at home." For Weintrob, however, this has been a pleasure; he says playing on his home computer is one of his hobbies.

Weintrob keeps up with technology in a number of ways. He makes time to read, or at least skim, the various technology magazines that land on his desk. He also enjoys using the computer tutorials that come with

new software—at home, of course. "I like to wander around and explore on the PC...and tutorials allow me to learn at my own leisure," he says.

But perhaps the most fruitful source of Weintrob's IT education comes from his participation in a

peer-group organization, the Financial Executive Institute's Committee on Information Management. "The committee is a group of 20 to 25 people like myself," says Weintrob—CFOs who are fascinated with emerging technologies. The organization provides him with a forum to talk about IT issues and to network with other CFOs who are experts in various aspects of technology. The group just returned from a trip to the University of Arizona, for example, where they explored groupware tools firsthand. "When I touch the technology, then I can appreciate it," he says.

Weintrob continues to rely on his CIO, too. "When it comes to applications, I tend to oversimplify things," he says. "My CIO, Karen Antion, gives me perspective and helps me see what is doable and what is not." And stumbling blocks remain. "Probably the biggest block that keeps us from learning about and using IT is the problem we have expressing the value of IT," says Weintrob. "How to determine the value of IT investments is an enigma to the entire IT industry, and that inhibits the use of technology.... Frankly, a lot of what I use and invest in, I just do because it feels right." Whoever can provide a key to unlock this ROI mystery, says Weintrob, will do more to enhance the IT education process for CFOs than anyone or anything else.

LEARNING BY COMMITTEE

NOT ALL EXECUTIVES ARE such IT enthusiasts as Stephens and Weintrob. John Dillaway, the 39-year-old vice president of sales at Moore Medical Corp., a pharmaceuticals distributor based in New Britain, Conn., says he is just too busy trying to bring in new sales and manage national accounts to spend his meager spare time learning about new technology. With a four-year degree in biology and 17 years of working at just one company, Dillaway does not bring a college background in computers or a home-PC hobby to his job.

But he knows that knowledge of IT is important to him and his company. "[Although] we're not on the cutting edge of information technology," he says, "we learn a lot through osmosis and through the grapevine." Communication with his peers at different companies in his own industry and others is his best source for keeping up with new software to help him do his job better, he says. "I also rely quite a bit on our own in-house IS department."

Reliance on the IS department has not always been productive, though. Ten years ago, Dillaway decided to set up an intradepartmental administrative group that would handle all the PC databases and presentations for the sales force. He hasn't forgotten that IS management was "anti-PC and opposed to sharing information." Now that attitude, as well as the old IS managers, have changed. But he still would like IS executives to "be as open as you can and share as much information as possible about the advances available in IT." Says Dillaway, "I think a lot of executives like me are overwhelmed by the sheer volume of information, the

speed with which everything is changing and the perceived difficulty of IT. So please," he exhorts information executives and technology magazines, "don't be so intimidating."

Dillaway believes that the biggest stumbling block he faces in his own

EXECUTIVE PROFILE

Name: John Dillaway, 39

Position: Senior vice president of sales for Moore Medical Corp. in New Britain, Conn.

Formal education: B.A. in biology from Assumption College

IT tools I use now: IBM AS/400 terminal

Next IT tool I'm looking forward to: Networking. We're getting our computers set up now to talk to each other. That is going to help us tremendously with our rebate program for wholesalers.

Last IT book I read: *Leadership and the Computer* by Mary E. Boone

Biggest barrier to IT learning: The jargon of the CIO

Personal IT education philosophy: We have set up an eight-person IT-savvy administrative group that takes the burden of IT education off the IS department and integrates with the sales department, so I manage my time better and I have a great education resource dedicated to me.





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IT education is the rapid changes in hardware and software. "No sooner do I get comfortable with something than it changes, so I have to be continually learning about technology," he says. For example, the order-entry system software has undergone several permutations, each of which requires Dillaway to sit down and figure it out. "But I also have to sell, so IT almost feels like an annoying distraction sometimes."

Meanwhile, Dillaway tries to make more time for reading; he is currently halfway through Mary E. Boone's book, *Leadership and the Computer*. But reading, especially computer techie publications that are littered with IT jargon, remains his least favorite education tool. "My favorite method of learning about IT is peer interaction," he says. "That's when I get to pick someone's brain about an IT challenge." And preferably, that someone understands the daily sales grind, too.

USER GUIDES

ALMOST ALL EXECUTIVES have PCs on their desks by now—although some showy machines may not actually be plugged in. John Blumenshine, the 45-year-old vice president of facilities at S&C Electric in Chicago (a manufacturer of equipment for the utilities industry), admits he hasn't even gotten that far yet, although he soon will.

But that doesn't mean Blumenshine is computer-illiterate. His department uses CAD software for construction layouts and other PC software to run its heating, AC, mechanical and electrical systems and for automating spare-parts inventories. It also has a proprietary PC-based security system. Managing 1 million square feet of factories on 45 acres, Blumenshine knows more than the average executive does about the demands of wiring a campus for networks.

But continuing to learn about information technology remains a difficult job even for him. Like the exec-

utives already profiled, Blumenshine says his greatest education challenge is keeping up with information that changes too fast. He gets over 30 magazines in his own field, and he reads *Business Week* and other general business publications for trends. "But I need to know the ramifications of cost and to understand implementation issues," he says. "I'm not a computer wizard, and the information is often so deep and so lengthy that it gets cumbersome."

A mechanical engineer by training, Blumenshine learned about computers from the electrical engineers at his first job in a Caterpillar Inc. foundry. "Those guys were not degreed engineers," he recalls. "They learned by doing, and they were the best teachers." Today, Blumenshine sometimes gets frustrated with the lack of formal education in his peer group. "In the world of facilities, the colleges still do not prepare the kids getting out of school for IT," he says.

One of the ways he keeps himself informed is by serving on S&C's IT

EXECUTIVE PROFILE

Name: John Blumenshine, 45

Position: Facilities vice president for S&C Electric in Chicago

Formal education: B.S. in mechanical engineering from the University of Illinois

IT tools I use now: I don't personally use a PC at my desktop yet, although my secretary does and my engineers do too. At home I have an IBM clone that my kids and wife use and I use for correspondence.

Next IT tool I am implementing:

Right now I'm wiring the factory complex for interconnectivity and merging the existing islands of automation.

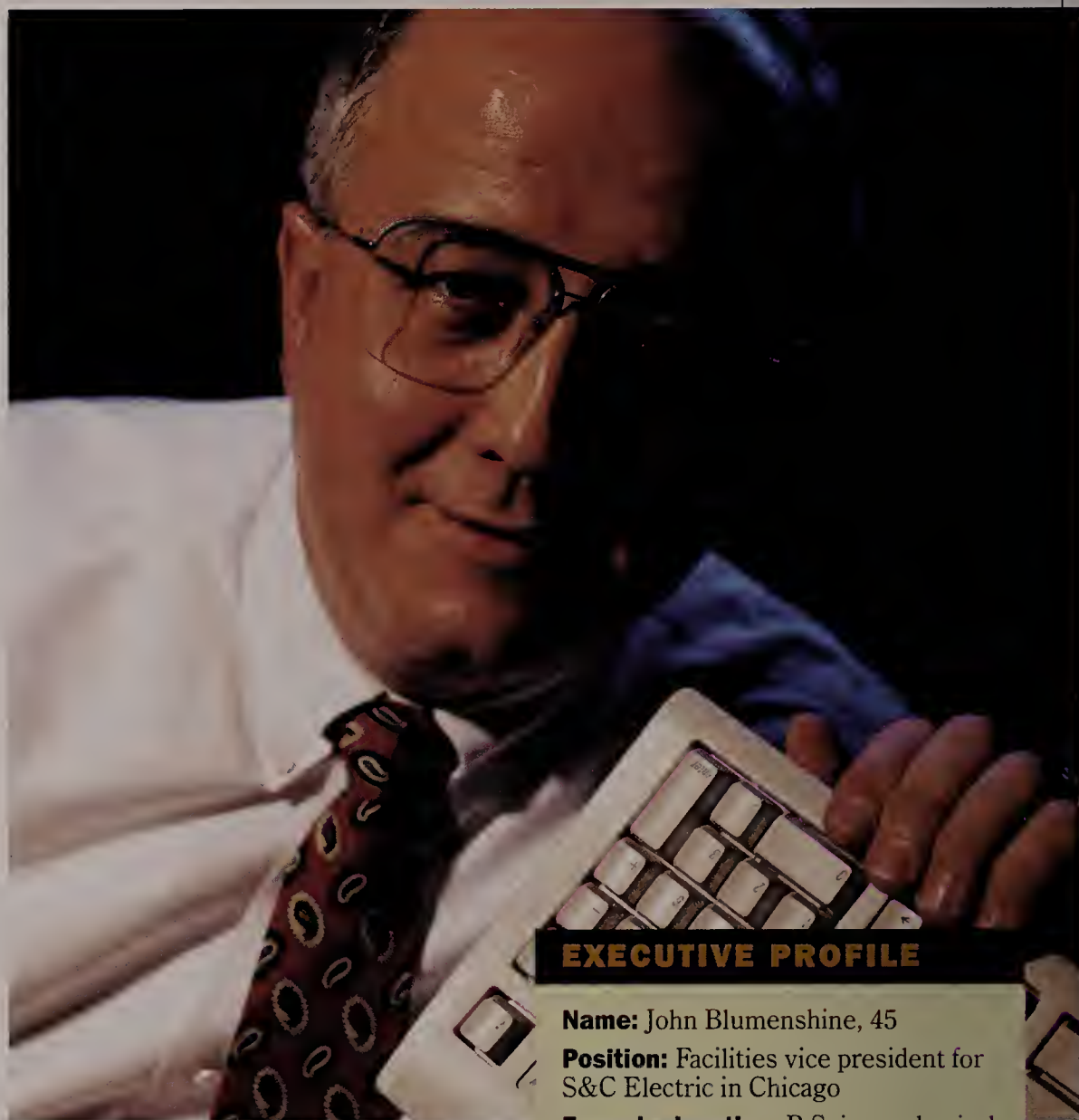
Last IT article I read: I don't recall a specific article, because I read 30 or so publications.

Biggest barrier to IT learning: Information overload

Personal IT education philosophy:

The best teachers are the people on the factory floor who have the knowledge. I don't have to understand how a computer works; I just have to understand its logic and how to make it do what I want it to do.

advisory committee with the president and division heads. Not only does this committee keep him up-to-date on IT trends and issues; he also contributes his knowledge about the physical aspects of IT decisions. "It's



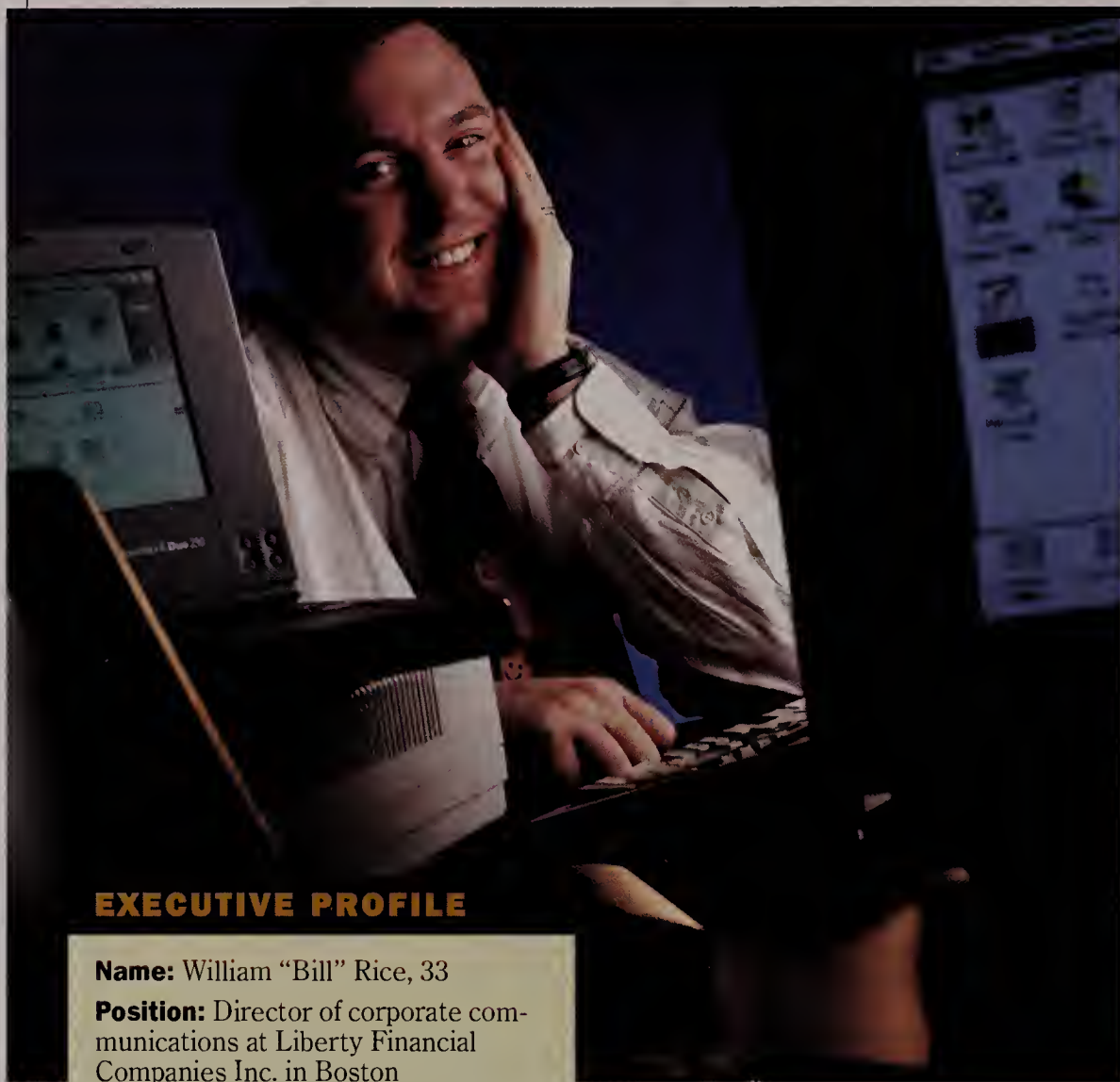
A group of people are gathered around a table in a dimly lit room, playing a board game on a checkered tablecloth. The room has patterned wallpaper and a window with lace curtains in the background. The scene is dark and moody, with light coming from the window and possibly a lamp. The people are focused on the game, and the overall atmosphere is one of quiet concentration and social interaction.

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EXECUTIVE PROFILE

Name: William "Bill" Rice, 33

Position: Director of corporate communications at Liberty Financial Companies Inc. in Boston

Formal education: B.A. in communications with minor in computing from Northeastern University

IT tools I use now: Two Macintosh machines and one PC in the office as well as two laptops (a Mac and a PC) for the travel between home and office

Next IT tool I am exploring: The Internet

Last IT publication I read: Two newsletters—*The Internet Letter* and *The Internet Business Advantage*

Most fun with computers lately: Getting my three children (between 2 and 5 years old) their first PC this past Christmas

Personal IT education philosophy: I enjoy one-on-one conversations about new technologies with folks in the IS department. I'm not afraid to ask, and I don't wait for the IT department to bring the technology to me.

not typical that someone like me would sit on a committee like this, but it is dangerous for companies not to include [the facilities executive]," says Blumenshine. "IT people are usually into the software side of the business. They don't get intimate with the physical implementation."

After digging out from the stack of

magazines on his desk, Blumenshine says his biggest concern is not his IT education, but the cost of wiring his factories for the future. "The cost," he says, "is just a tremendous pill to swallow."

ANYTHING GOES

WHAT A DIFFERENCE A decade or two can make. At age 33, Director of Corporate Communications William Rice is the youngest and perhaps most IT-savvy executive interviewed for this article. Rice vaguely recalls the punch-card machines that were on their way out just as the Apple II computers came in during his senior year in college. A communications major at Northeastern University, Rice took a heavy course load of Basic and Pascal programming. He also produced a newsletter in the university's communications department on a Digital Equipment Corp. word-processing machine. "I did desktop publishing before anyone called it that," he says.

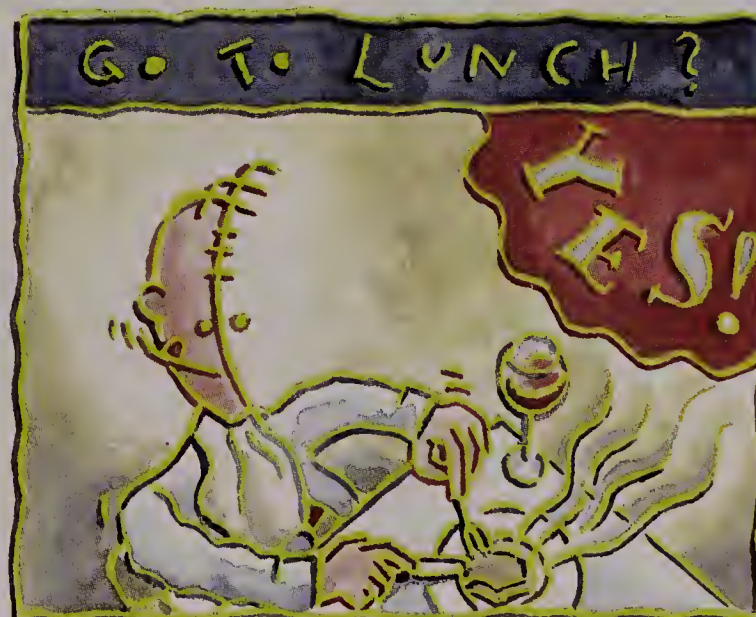
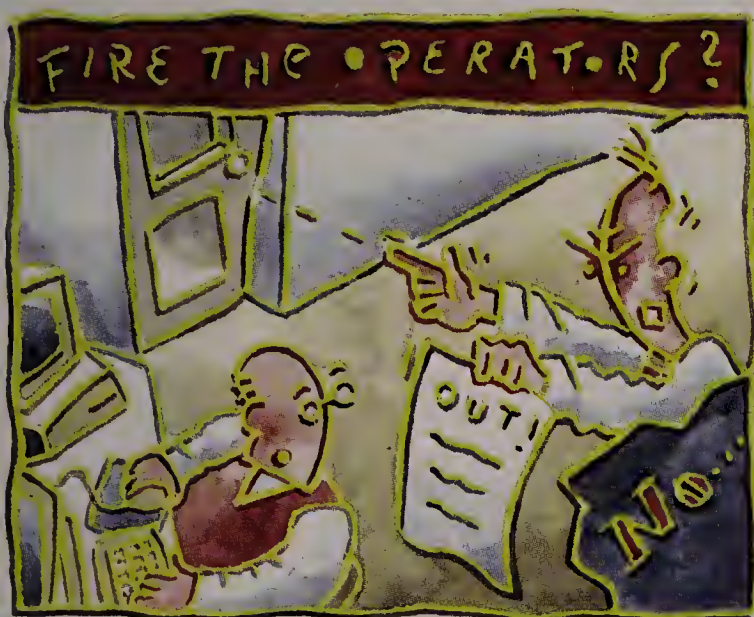
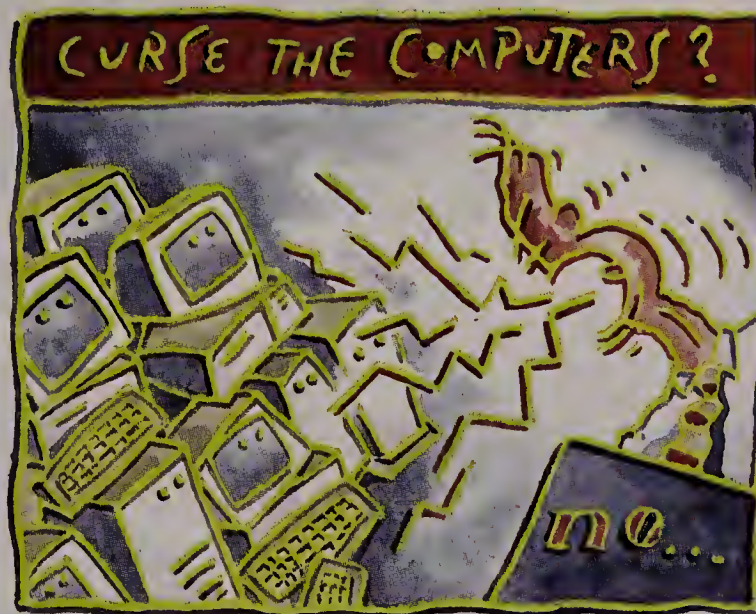
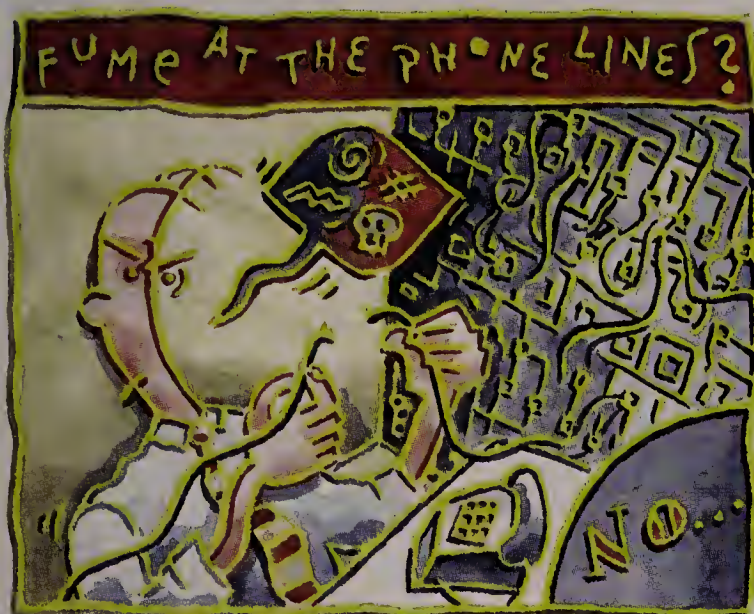
Now, as communications manager at Liberty Financial Companies Inc. in Boston, Rice uses two Macintoshes, one PC with a Radius pivot screen, a scanner and two laptops, which help him get work done on the train ride to and from work each day. "I'm perhaps more comfortable with technology than the typical marketing guy," he acknowledges. "A key to my continual learning experience has been to have bosses who have allowed me to try new things." Rice also has gone out of his way to nurture a close working relationship with the IS folks. "I recognize that IS people often don't get the credit they deserve," he says. "I understand some of the challenges that they face."

Thanks to this trusting relationship, CIO Dan Wright and his IS team give Rice evaluation copies of software with which to experiment. Also, Rice, who has introduced 10 Macintoshes into an environment dominated by 800 PCs, has become the company's unofficial Mac expert. "I have my Mac focus here and the IS department has PCs, so we have a friendly rivalry going," he says.

Aside from informal lunch breaks and hallway discussions with computer techies, Rice keeps his IT education up-to-date by reading a lot—five daily newspapers and dozens of magazines. He prefers newsletters that focus on a particular topic (his current favorite is *The Internet Letter*). Low on his list are mainstream tech publications like *MacWorld* and *PC Week*, which he only skims for ads when he is ready to buy some new equipment. He also attends seminars on specific topics of interest. "I look for strategic, future-looking seminars," he says. "They may have only two or three sessions I will attend, but I don't have time to go all day anyway."

If Rice were in charge, what would he do to improve the IT learning environment? "I'd have computer training be a mandatory part of orientation for every new employee, from the secretary to the executives, because these days everyone has to be comfortable on a computer." **CIO**

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They Reign

Taking a home-grown business overseas and developing new products in a foreign environment are tough challenges. Hewlett-Packard is succeeding at both in Spain through a shrewd choice of location, innovative management and the skillful use of IT.

BY GARY ABRAMSON

HEWLETT-PACKARD CO., the \$25 billion maker of computers and communications and measurement products and services, has enjoyed considerable success in moving into global markets. Worldwide revenues from outside the United States totaled \$13.5 billion in fiscal 1994—up 23 percent from the previ-

ous year. Some of the reasons for that success are clearly evident at its youthful and fast-growing printer division in Barcelona. Set up as a small manufacturing base in 1985 with 35 employees (it now employs 818), the

division has steadily added products and taken on responsibility for R&D and marketing of all large-format printers worldwide. Thanks

in part to its introduction two years ago of ink-jet technology to large-format printers, that market is now growing 40 percent a year. "We rejuvenated a category that's been stalled for a long time," says Marketing Manager Greg Wallace. "We're compelling people to come back into the market."

But to grow as it has, BCD (BarCelona Division) has needed more than just marketing insight. First, the division has made the most of HP's innovative business culture, which emphasizes teamwork and flexibility. Ideally, that means sharing work across time zones and among offices worldwide—something that would not have been possible without a major investment of time and money in information technology. With the process of link-up mostly accomplished, BCD is exploiting the benefits of being in one of Europe's most forward-thinking regions while overcoming many of the usual drawbacks of working across great distances.



Catalonia has a strong and well-established commercial tradition.

in Spain



MANUFACTURING MANAGER JORDI PIE, JOSE CONEJOS and RICH RAIMONDI confer in the general manager's shared work space.



The European market currently accounts for 56 percent of HP's printer sales worldwide.

Just how untraditional the corporate culture is, and how it can be implemented so far from corporate headquarters, jumps out at any visitor to the BCD plant in San Cugat del Vallès, an emerging high-tech industrial belt 20 minutes from downtown Barcelona that wags have taken to calling "Silicon Vallès." One enters through a main gate, down a long, looping driveway on a sprawling site of rolling green lawns that resembles a community college campus missing a few build-

ings. Inside, heads bob across low-cut partitions that stretch across a main room the size of a football field. An apparently uniform maze of passages buzzes as managers stop by to chat with staff and monitor progress, a required part of their jobs. And teams working on their latest projects bounce their ideas nine hours back to California co-workers on a \$500,000 set of communications networks developed here to bridge the "virtual gap" of one continent and one ocean. The staccato, slightly



YANNIG CHAPELAIN (left) and CUCA RICOMÀ: *internal communication; external links with suppliers*

nasal sound of Catalan, the native language of this Mediterranean region in northeastern Spain, pervades the shop floor.

"When this operation started 10 years ago, I don't think anyone in his wildest dreams thought it would get this big," says General Manager Rich Raimondi. BCD developed out of the need for the company to get closer to its European customers, who now account for 56 percent of the large-format printer market, while still operating within the rather special business culture known throughout this multinational corporation as "the HP way." (This describes a management style that is responsive to the needs of customers and the input of all employees in product in-

novation. A book by that name, written by HP co-founder David Packard, is being published this spring by HarperCollins.)

Further signs of just how much "the way" differs from a typical multinational appear as you reach Raimondi's "office," barely distinguishable within the maze of cubicles except for an unassuming name tag on the side of the doorless entrance. Raimondi sits at a small, round conference table that just about fits inside the poster-pegged, partitioned area he shares with the head of PR. Several bulging if meticulously ordered shelves of folders, manuals, books and assorted paraphernalia required to run the \$446-million-a-year business dominate the rest of the space.

The office is just one element of a nonhierarchical structure and style designed to break down barriers, en-

courage teamwork and foster communication. "We are an employee-owned, manager-supported company," is how Personnel Director Jose Conejos puts it.

To take one example: Though Raimondi could obviously get others to

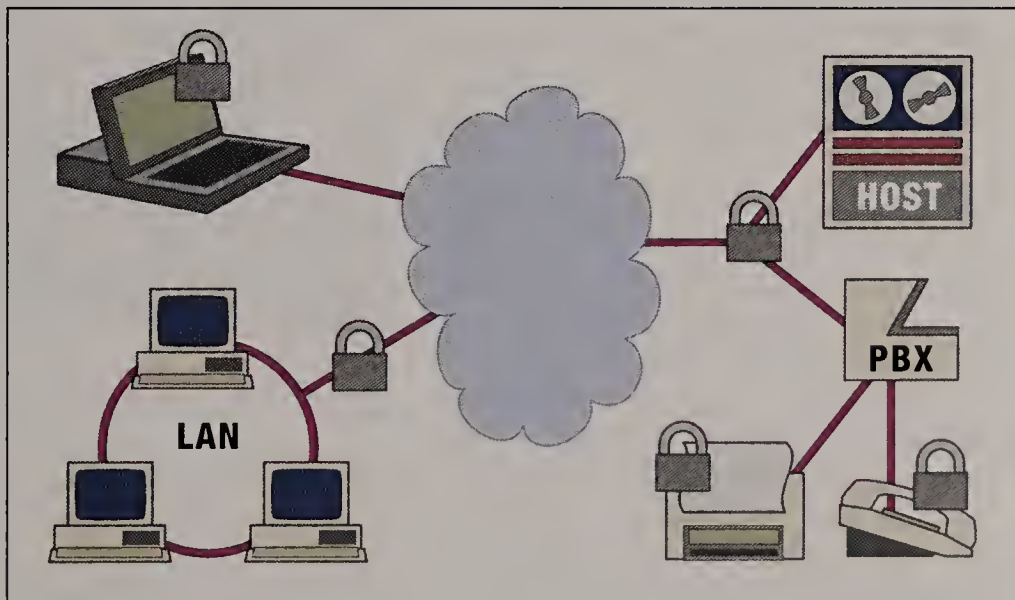
T*he nine-hour time difference between the U.S. West Coast and Spain can be turned to advantage, as one side of a team picks up in the morning where the other left off.*

do small tasks, he clearly prefers getting up with a visitor to personally find and nab the IT manager, who happens to be standing inside yet another of the salmon-colored cloth cu-



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CATALONIA WAS THE CENTER of a mercantile Mediterranean empire long before Spain became a unified state. One of the few things Catalans and other Spaniards agree on is that unlike much of the rest of the country, the region has reached the late 20th century with its commercial tradition intact. Its forward-looking character is one reason HP established its division here.

bikes a dozen yards away, to check some requested figures. The photocopy machine is around the corner, and Raimondi finds no reason for a secretary to handle that, either.

"This is a firm that emphasizes oral communication and puts a high emphasis on all employees being informed about the business," says Internal Communications Coordinator Cuca Ricomà de Castellarnau. "It's a motivational issue, of knowing where the business is and where it's going." When BCD began its new fiscal year

in October, she recalls, Raimondi held forth at "informational coffees" that allowed HP workers on all three eight-hour shifts to hear about the new year's goals and to question the man at the top if they chose.

At smaller gatherings, managers examine how their departments can meet the targets of the new budget. The pattern flows downward into departmental meetings in which individual employees can offer ideas about how they or their teams can contribute, Ricomà says. A key part

of her job is choosing communications "technology," which in Ricomà's parlance means deciding whether the information comes across in face-to-face meetings, memos, e-mail or by other means.

While implementing HP's culture at the Barcelona plant appears to have gone smoothly, linking that culture of open access to the parent company's worldwide operations has not. "Being 6,000 miles away has posed special challenges in communication," says Raimondi.

Two years ago, HP managers began talking about "making this a virtual site," he says. "We would do everything we could to make those [distances] as invisible as possible." Spain, however, suffers a lag of about two years behind the United States in availability of IT services, according to Barcelona's IT manager, Yannig Chapelain. The voice-mail system HP was using was not certified by Telefonica, the state-run telecom-

Room to Grow

To ensure its own success as it expands, HP Barcelona invests in the professional growth of its employees

People at BCD say one reason for its progress is the open-ended nature of jobs that allow individuals to grow as they are able. "Much of the value added comes from the development of individuals," says BCD's personnel director, Jose Conejos. A few examples: An engineer in the quality department recently suggested his monitoring of hardware could be extended to oversight of software. Another proposed his responsibility for

munications monopoly; Barcelona had to work with Telefonica to integrate its systems with Telefonica's PBX. The problem was solved just last year. Transmission costs were also a problem. Overseas leased lines in Spain cost 10 times the U.S. rate, so Barcelona cannot use T1 lines as the U.S. divisions do.

The upshot turned out to be an investment of about \$500,000 in a mix of IT solutions so employees can share information and cooperate with just about anyone within the 98,400-strong HP workforce. This is important to a company that fosters individuals and groups to initiate cooperation and learn from what others are doing. About \$100,000 was spent on videoconferencing, between \$120,000 and \$150,000 on voice mail, and from \$200,000 to \$300,000 on Internet connections.

Now, most drawing and engineering information can be shared on the Internet, and the nine-hour time difference between the U.S. West Coast and Spain can be turned to advan-

“There’s a limit to what videoconferences and phones can do. You have to be more innovative in this situation to get things done.”

—Greg Wallace

tage, as one side of a team picks up in the morning where the other left off. “We can, in a sense, operate 24 hours,” Raimondi says, adding that engineering work on printer ink between San Diego and Barcelona was done that way.

Marketing Manager Wallace, who arrived from HP’s Vancouver desktop printer division in August 1993,

admits to some frustration with the long distances that make face-to-face meetings infrequent. “There’s a limit to what videoconferences and phones can do,” he says. “You have to be more innovative [in this situation] to get things done.” His solution was to create “seam teams” to keep the multilocation development process of new products in place. While making full use of the networks, his group adds quarterly summits and management reviews to make sure nothing slips by.

Barcelona’s investment in IT is not only aimed at HP overseas connections, however. Plans for 1995 include setting up file-transfer capabilities with external suppliers in order to co-develop products, Chapelain says. Last year the company began using electronic data interchange for the first time with suppliers. “We needed something simple our suppliers could use,” Chapelain says. As investments continue, he pre-

quality control could be extended from development to manufacturing. Managers are now looking at it.

Cuca Ricomà, director of internal communications, says: “I get new responsibility continuously.” She has been at her job, which she says exists only at a handful of other firms in Spain, for a year and a half. Like all HP employees, she has a career-development plan that is revised each year. In the meantime, she travels to HP sites in Geneva and Grenoble to see how other plants operate and is sent to seminars abroad. “You have to be state of the art,” she says.

Teresa Fonollosa, a 32-year-old secretary in HP’s manufacturing department, started out on HP’s assembly line eight years ago after part-time work at a butcher shop while finishing vocational high school. She had also done a stint in supermarket meat departments.

Within a year at HP, she recalls, “I asked to be told if something else

presentations, trips, meetings and company visits.

Fonollosa describes her struggles to “satisfy the needs of my clients”—meaning her superiors—when the department underwent restructuring. “As a secretary, I [communicate] at a level with other employees that is harder for managers to do, so obviously I make suggestions based on that,” she says. “I can be right or wrong, but we always discuss it.”

In 1995, according to her revised annual plan, Fonollosa will get courses in color printing and learn to use Adobe Photoshop, Corel Draw and other design software. She says “the change is obvious” between her previous and current employers. “At other firms you’re there to be stepped on and paid only because they have to. Here they want you to be content.” The result, Fonollosa believes, is higher productivity and an interest in doing the job well. —G. Abramson



TERESA FONOLLOSA: *What’s good for employees is good for the company.*

came up.” She landed a new assignment processing orders in the manufacturing department. Two years later, Fonollosa moved into a secretarial job. Now she works with development engineers and helps prepare managers’

dicts BCD "will be more and more a virtual company."

The fundamental aim of the IT department, Chapelain says, "is making information accessible." Thus, the Barcelona staff works in-house with Lotus Suite (Ami Pro, 1-2-3, Freelance) but can also use Microsoft Excel to work with external

Technical Profile

Hewlett-Packard Co., founded in 1939, makes mainframes, PCs, servers, workstations, printers and other peripherals, as well as electronic equipment and applications for the health, engineering, chemical and other industries. It opened its Barcelona division in 1985. The division now employs 818 people out of a worldwide staff of 98,400. The Barcelona operation designs, manufactures and markets large-format printers and also makes desktop printers. It reported sales of \$446 million in HP's fiscal year ended October 1994, out of worldwide sales of \$25.4 billion in more than 110 countries. Parent company net profits were \$1.6 billion.

Infrastructure: LM-X LAN Manager on HP Unix platform uses HP Bridge and HP Hub. ISDN connection to the Internet allows sharing of work on projects in R&D labs worldwide. Octel voice mail. HPDesk e-mail connects the Barcelona division to all 98,400 HP employees worldwide.

Midrange Systems: HP 3000 with MPE proprietary open system; HP 9000 with Unix operating system

PCs: HP Vectras

Software: For PCs, Lotus Suite (Ami Pro, 1-2-3, Freelance); staff can also use Microsoft Excel to work with external partners; for order processing, HP customized; for manufacturing, HP Material Management.

partners. Software is customized when necessary, but "the trend nowadays is to look for external ready-made," Chapelain says.

One innovative use of videoconferencing has been to provide continuing education to the Barcelona staff through access to courses at

Stanford University in California and the National Technical University in Fort Collins, Colo. Though Spain has a smaller pool of top-level technically trained staff than the United States, Raimondi says, the R&D department has been absorbing an increasing number of local employees. Spaniards now head four out of five departments at BCD, the exception being two Americans in charge of R&D.

The forward-looking character of Catalonia, in fact, is one of the reasons HP established this division here. Now a prosperous region that enjoys a large degree of autonomy from Spain's central government in Madrid, Catalonia was the center of a mercantile Mediterranean empire long before Spain became a unified

Ironically, now that HP's printer division is solidly anchored in Barcelona, the biggest sales growth is forecast for Asia.

state. One of the few things Catalans and other Spaniards agree on is that unlike much of the rest of the country, the region has reached the late 20th century with its commercial tradition intact.

In the 1980s, as Spain joined the European Community and foreign investors rushed in, Catalonia welcomed a disproportionate amount of the flow. HP took notice of its pro-business politics, its respected academic and scientific communities, and its European and international outlook. Plus, perhaps, one more factor that Raimondi says helps attract top talent: "The quality of life here is excellent."

Catalans, who make up 90 percent of the workforce at BCD, "are good, common-sense people," Raimondi says. "They have a word for it: *seny*. They ask, why invest in something if

I can do it cheaper?" The Catalans are also easier to retain because they move less than other Spaniards, he adds. The region is a traditional magnet for job-seekers from poorer parts of Spain, and few Catalans prefer to live elsewhere.

"In my two and a half years here, I've been impressed with follow-up and innovativeness," Raimondi says. While in many companies employees shy away from unfamiliar ways of operating, "the people we have don't know what 'not invented here' means."

Such openness and innovation will be essential as BCD strives in the next several years to stay on top of the booming market for CAD-capable large-format printers, whose sales are rising by 40 percent worldwide each year. Raimondi says his objectives for 1995 include developing new capabilities for low-end CAD printers and to further develop the full-color large-format printers that are the division's main business.

Ironically, now that HP's printer division is solidly anchored in Barcelona, the biggest sales growth is forecast for Asia. Within three to five years, Wallace predicts, Asia will rise from the current 20 percent to one-third of world sales, while Europe's share will slide from the current 56 percent to one-third. BCD will have to design products for local Asian needs.

"We will explore over the next year if we need a manufacturing site in Asia," Raimondi says. The savings would come on freight and duties rather than labor. Because the large-format printers are now primarily used with Macintosh applications, "we've had to invest in Mac literacy" for design and training teams for the last 18 months, Wallace says.

The halfway-around-the-globe cooperation required to keep ahead in the Asian market may make BCD's virtual feats so far seem easy. **CIO**

Gary Abramson is a foreign correspondent based in Madrid.

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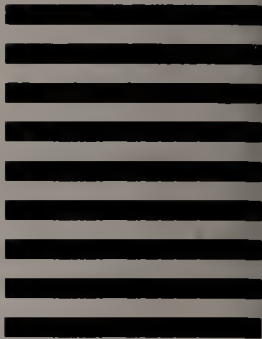


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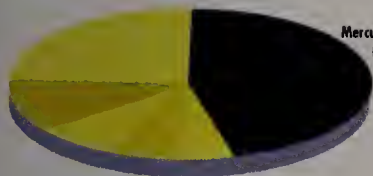
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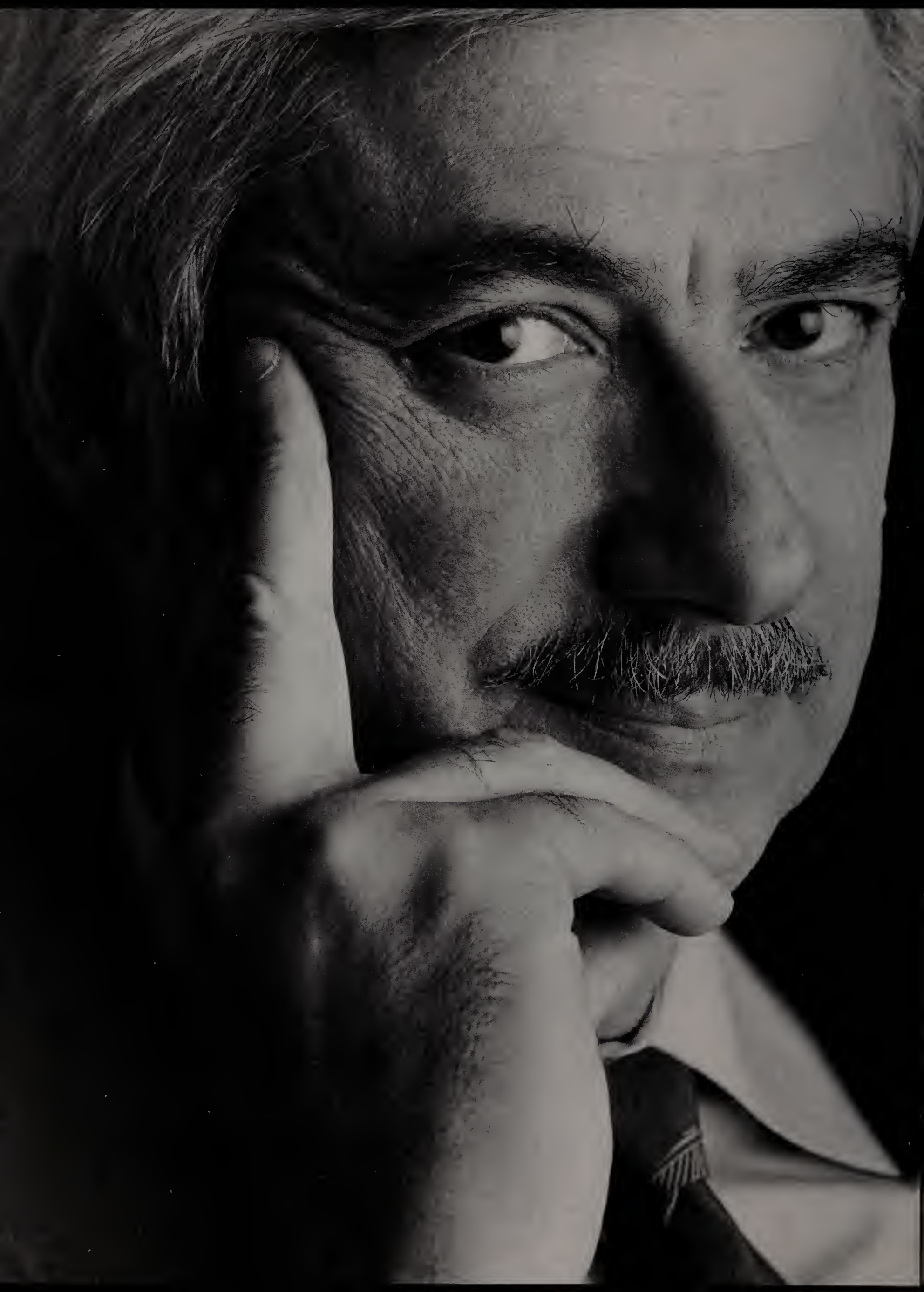
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THE IMPORTANCE OF GETTING SMART



Are you in the knowledge business? Do your company's products or services feature built-in intelligence or get smarter as they are used? If not, you probably won't make it in the emerging knowledge-based economy, where intelligent products produced by smart organizations set the standard for prosperity.

That's the thesis of *The Monster Under the Bed* (Simon & Schuster, 1994), the latest work by Stan Davis, author of *Future Perfect* and *2020 Vision*, and Jim Botkin, University of Texas fellow and president of InterClass, a Fortune 500 learning consortium. But *Monster* is not just another knowledge treatise. The book concludes that the United States' public-sponsored educational system, with its technophobias and its bureaucratic traditions, may be the country's major impediment to knowledge. The private sector, like it or not, will have to ensure its own survival by filling the gaps left by

Information is out.
Knowledge is in.
And Stan Davis
thinks the
education system
needs to smarten up
if companies are to
prosper in a
knowledge-based
economy.

BY RICHARD
PASTORE

the school system's shortcomings. It has already taken on the role of chief post-graduate educator in a lifelong learning process for employees and customers.

For CIOs and other corporate executives, the imperative is to promote the exploitation of knowledge, both internally and in the marketplace, and to foster the educational reforms necessary to do so. The first step is to accept the fact that data—the basic building block of today's information economy—is now a nonstrategic widget, a commodity. Information—the arrangement of data into meaningful patterns—has replaced data in strategic importance. Although information is still in a growth cycle, it too will mature and lose its strategic value. It then will be replaced by knowledge, the productive use and application of information.

From his residential office a few doors down from a school playground, Davis recently spoke with Senior Editor Richard Pastore about the growing role of busi-

ness in education and the implications of the knowledge economy for CIOs.

CIO: *Cynics might say the knowledge-based business is just another buzzword and consultant-coined paradigm being forced onto CIOs' already crowded plates. What do you say to that?*

STAN DAVIS: There is a danger that they will say that. It's comparable to a CIO saying 20 years ago that "the concept of information is just one more thing on my plate." Chief information officers were not called chief information officers 10 or 20 years ago. They were called data-processing administrators. By repositioning themselves as CIOs, they were making a statement about being intrinsically important to the strategic future of the corporation. The same thing is going to happen again with knowledge. CIOs who don't make the strategic shift will go the way of the data-processing administrator.

CIO: *CIOs are the stewards of the technology you say is pivotal to a knowledge-based organization. Does it follow that CIOs will be stewards of the organization's knowledge—chief knowledge officers, in effect?*

DAVIS: CIOs may be the stewards of knowledge in terms of hardware and software, but what they have to do is focus on how to build this into the products and services the company offers. This is a critical shift. The focus should not be mainly on using knowledge to be more efficient in running your business internally. It should also be about how to use knowledge externally in the marketplace and with your customers, which means building it into your products and services.

The main message that I want to get across is that the CIO's responsibility is to get the key people in the corporation to appreciate the profound difference between information and knowledge, to appreciate that it's as significant as the difference between data and information.

CIO: *How can CIOs actively help incorporate knowledge in the business?*

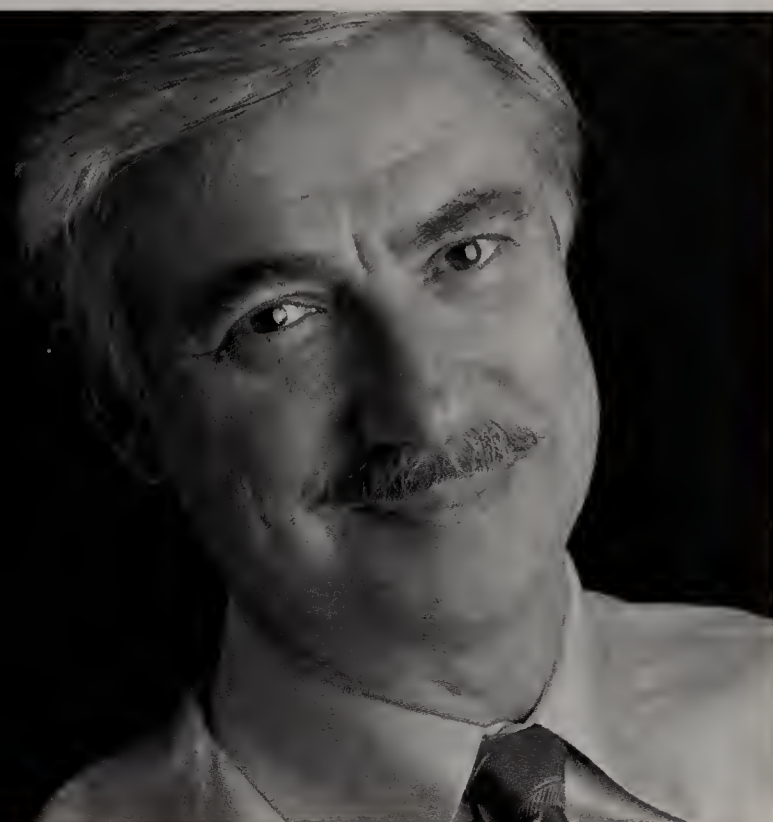
DAVIS: They must ask themselves, "How will my corporation be different if I think of it as knowledge-based instead of information-based?" They should take products, services, markets and organizations, and break those down and take a look at the knowledge implications of each. With regard to products, they should take every one of the products that are offered now and ask what would it take to ratchet it from an information-based offering to a knowledge-based offering. If you're in the business of socks or thermostats or steel-belted radials or what have you, how can those products get smarter with each use?

CIO: *How about trying that exercise yourself? How would you leverage knowledge in a home mortgage?*

THE CIO'S RESPONSIBILITY
is to get the key people in the
corporation to appreciate the
profound difference between
information and
knowledge.



WHEN THE SCHOOL SYSTEM
does not provide the human
resources that businesses need to
run, the businesses will have to
provide that training themselves.
And that's tragic.



DAVIS: A knowledge-based mortgage would learn more and more about you once it's written. It doesn't stop. A traditional mortgage collects heaps of information about you, but only as you exist in a frozen moment in time. A knowledge-based mortgage would have that information consistently updated in real-time, enabling the mortgage to be adjusted in real-time as well.

CIO: *How about a movie theater?*

DAVIS: When you get somebody to enroll in a frequent-buyer club (like Waldenbooks') or a frequent-flyer club, the most valuable thing you get is all that information. Why not tie moviegoers into that? Once there is a frequent-buyer club, theater owners could track that information internally and add value to a mature operation, as happened with airplane seats. First you could walk to the back of the plane and use the telephone. Now there is a telephone at every seat. Then there was one movie screen for everybody. Now there is a screen at every seat.

CIO: *Let's throw in the kitchen sink.*

DAVIS: All of the appliances in the kitchen have the ability to be knowledge-based. But the sink is not really a mechanical product. Some sinks are no longer standalone items but part of the whole countertop. So, depending on just how strict you want to be: The sink/countertop could have a screen in it that can bring up recipes so you don't have to open a book. In real-time it can absorb updates so, for example, with voice recognition you could tell it to add more sugar, depending on how the meal turned out. It's a smarter kitchen-sink area because you can chop the onions at the same time that you're reading the recipe at the same time that you're speaking into it.

CIO: *In your book, you contend that along with the advent of the knowledge-based economy, business is assuming more responsibility for education—teaching employees everything from remedial reading to the latest technologies. Do you believe that the business sector should become the country's educator?*

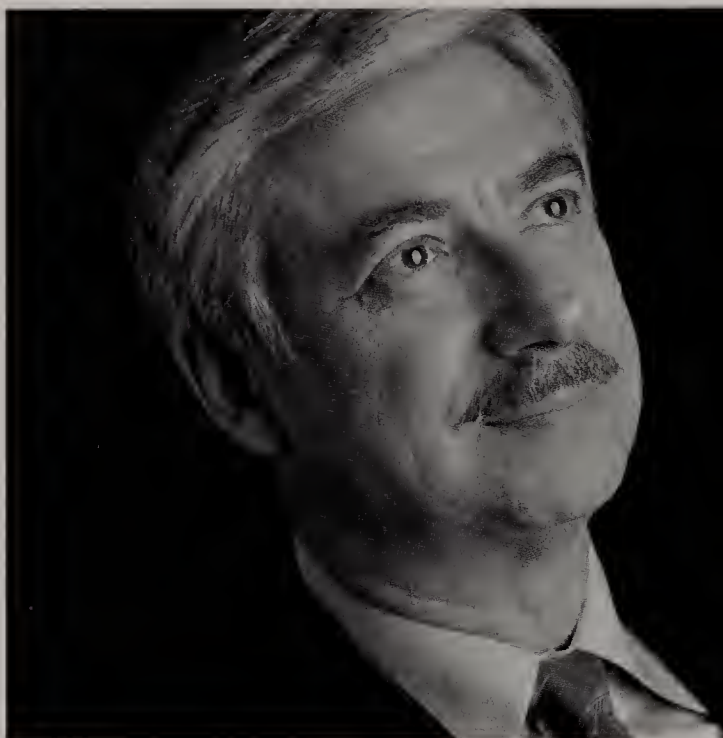
DAVIS: Companies are not in business to do that. They don't want this mantle, and I'm not saying business should take over education or the schools. But do you think companies want to interview 20 people for every one they hire because the other 19 don't have the basic education? When the school system does not provide the human resources that businesses need to run, the businesses will have to provide that training themselves. And that's tragic. It would be far better if the educational community did the training that was needed and business could stick to its business.

CIO: *Technology seems to be the Achilles' heel of the K-12 system today. What's the problem there?*

DAVIS: In order to survive, business has got to keep up with evolving technologies. Education, as it is currently configured, does not. There are few TVs and telephones, VCRs and camcorders, faxes and modems inside the classrooms, and that is a large part of why [the education system is] falling increasingly behind.

The management of our educational system—teachers and administrators—while very good people, are intimidated by technology. They will adapt to it, but in all probability not for a generation, when the young kids of today who are computer literate and comfortable with information technology start taking jobs as teachers and administrators in schools.

CIO: *What are the options for business in the meantime?*



AS LONG AS TRAINING IS SEEN
as overhead and a cost, then telling
people inside the company that they
ought to invest in education is
whistling in the wind.



DAVIS: Business will have to educate its employees and customers to the degree necessary. They'll pay for it directly and indirectly—indirectly through taxation and alliances and support of educational institutions, and directly by contracting with educational institutions. There are already 140,000 such alliances in the U.S. Many of these apply to more-advanced education such as executive training programs. For example, I was recently talking with one corporation contracting with four business schools to be its worldwide suppliers of management training. The corporation will tell the schools how to build that program for its knowledge-based needs of the future.

CIO: *Corporate training for years has been a sacrificial lamb to budget constrictions. Is that changing now?*

DAVIS: As long as training is seen as overhead and a cost, then telling people inside the company that they ought to invest in education is whistling in the wind. What we need to do is change our taxation and accounting systems so that if you invest in training someone and that person leaves you, then you can take a tax write-off on it. When we begin to do that, then we can see ourselves building an intellectual asset base.

CIO: *CIOs increasingly complain that they can't get qualified staff, people right out of school with understanding of technologies like object-oriented programming and business concepts such as customer-focused attitude. What can they do about it?*

DAVIS: If that's the complaint, then they're faced with a decision—to make or buy. Some are going to build an in-house capability to train at this fundamental level, and others are going to consign it out.

CIO: *Most firms already encourage employees to seek training both internally and externally, and they offer*

tuition reimbursement. That's not enough?

DAVIS: Few companies tell their employees, "Here are the subjects we most need people to be educated in." Companies should direct reimbursements to where their needs will be and adjust the amounts on a sliding scale every six months until those needs are met. If what you need are object-literate people, ask them to take courses in that discipline and pay them to do it.

CIO: *In your book you say it's as important to educate customers as it is employees. How will that happen in the knowledge economy?*

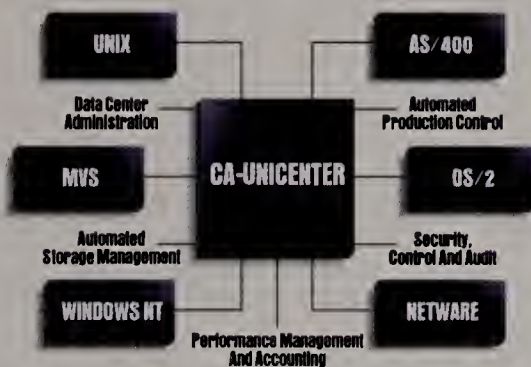
DAVIS: A small proportion of customer learning will take place in formal training classes. But most of it will be built into the product, as when Apple made it easy to learn how to use a PC. Most people learned how to use PCs without ever going to a training course. They learned through the use of products and services.

CIO: *As you observe in your book, companies that want to get ahead are also educating their business partners. For example, they might teach them how to more effectively utilize their EDI links or advise them how to better serve their customers, thus creating more business for both partners. How important a role do you think the education of business-to-business customers as well as end consumers will play in the future?*

DAVIS: In way over 90 percent of instances, most of the training budget is intended for employee education. Very little of it is for training customers, suppliers, competitors and strategic-alliance partners. In the business world to come, the ratio of education investment should shift at least 30 percent from the employee toward the customer and these other corporate groups. It's all very evolutionary, not in the sense of taking a long time but in the sense of survival of the fittest. **CIO**



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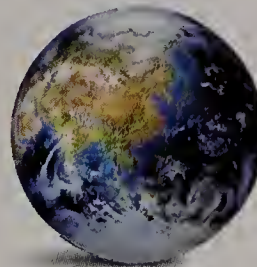


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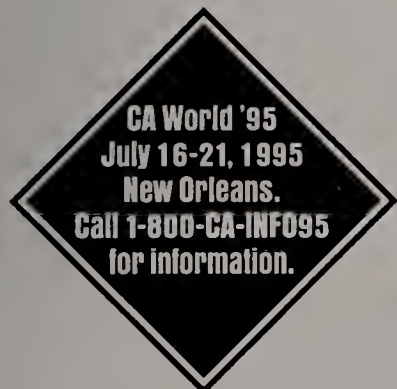
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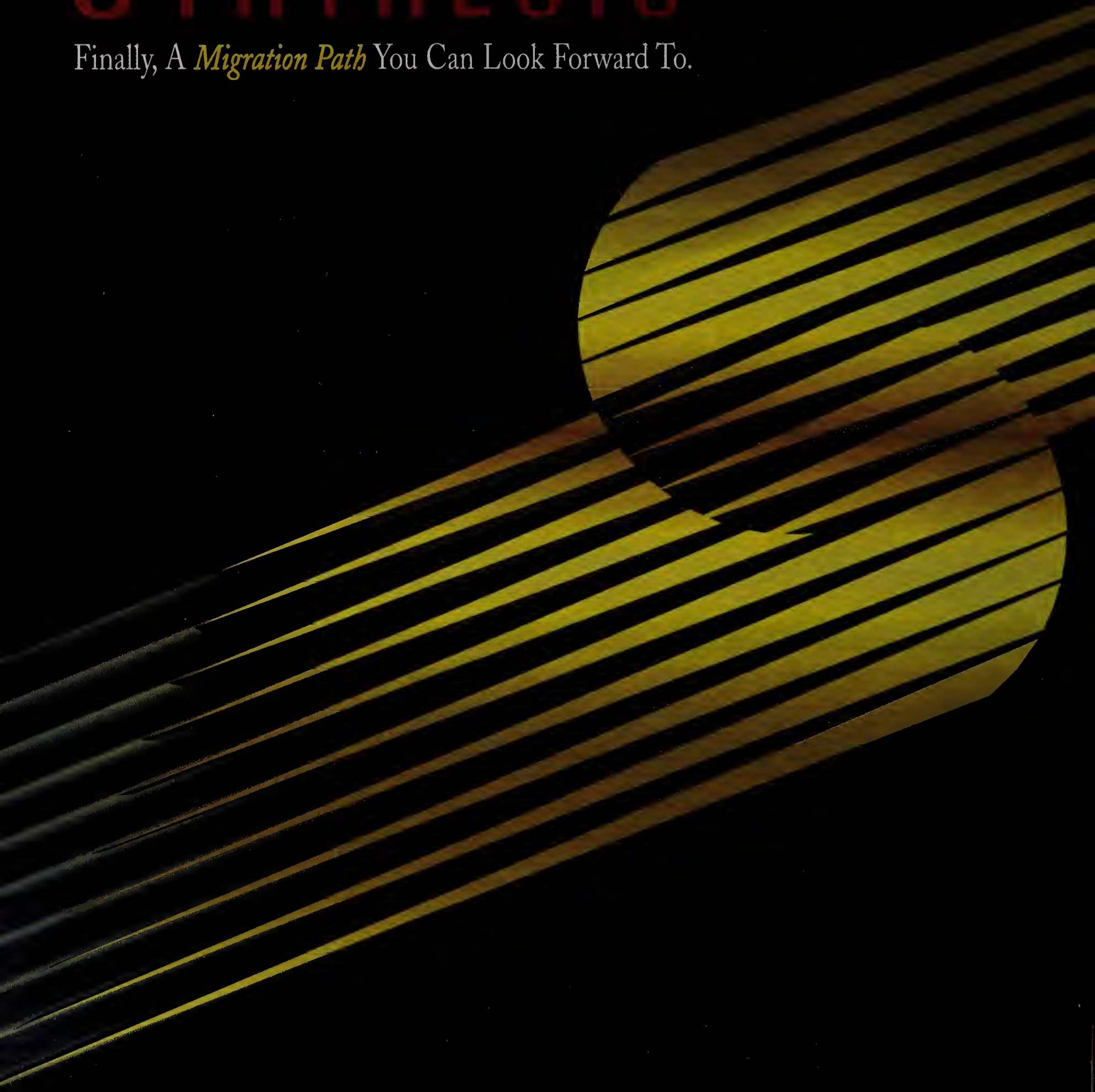
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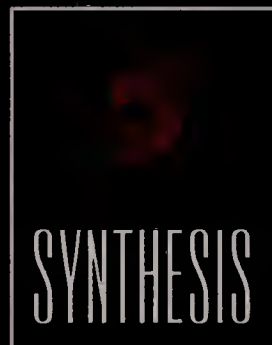


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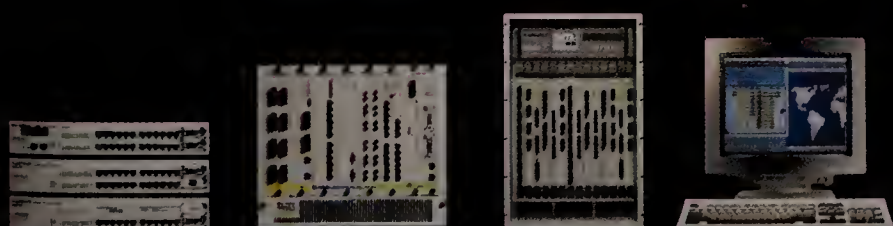
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Continued from Page 76

master every now and then and lay it at his feet, stepping back and waiting to be praised as the recipient tried to keep his gorge down over the pageant of torn fur and guts. In time, it became clear, Walt got to like the quality of data and scuttlebutt that was being spread out before him. Stanky got past the burnished mahogany door more and more.

This is perhaps understandable on Walt's part, especially now. The industry of which I am a proud member is changing almost daily. Mergers and acquisitions, for a time on a comfy hiatus while nobody had any money, have taken off again with éclat. Stuff is exploding all over the place, and big combatants are on the field, guys whose names cause investment bankers to bend over and walk funny due to the size of their erections. In this environment, information is hemoglobin. Coherent strategies coalesce in the air around you and decay like gluons in a particle accelerator. Everybody's got his favorite flavor, too. Your best friends are the guys who believe in your vision of the future. Guys who carry seeds of doubt or discontent are not welcome. For the membership in the inner circle, only allies need apply.

Which, I guess, brings us to Morgenstern. Morgenstern is a schmendrick. What is a schmendrick? I'll tell you. A schmendrick trusts other people simply because they are sitting close by, having a beer. In a delicate situation, with arrows flying everywhere and friends and enemies wearing the same uniforms, a schmendrick is the guy wearing a bull's eye on his back. He's doomed.

I like Morgenstern. He's big and floppy and unbusinesslike, and, poor dude, he almost bought the ranch, thanks to certain indiscretions of which he was no doubt guilty, but most of all for expecting too much of his fellow man. It happened this way:

Morgenstern and the Stank were waiting in the boardroom for some of the investment bankers we hire to advise us to make some transaction,

any transaction, so they may earn a fee. With all the possibilities for value creating out there, it isn't hard to find ideas, both good and bad, around.

**What is a schmendrick?
I'll tell you. A schmendrick
trusts other people simply
because they are sitting
close by, having a beer.
In a delicate situation, with
arrows flying everywhere and
friends and enemies wearing
the same uniforms, a
schmendrick is the guy
wearing a bull's eye on his
back. He's doomed.**

Some of these notions are very strange indeed and difficult to understand. That does not mean they can't or shouldn't be entertained, especially if one has hired investment bankers to propose them.

At any rate. The room was quiet, the air was cool and dry, and Morgenstern began to talk. "Walt's a good guy," he reportedly said, "but I don't think he takes a rigorous enough look at the implications of some of the deals we've got going down." Stanky listened. Morgenstern continued. "In fact, I'll be honest with you, I don't even know why the guy has financial analysts around. He's not listening and blah, blah, blah, and rag, rag, rag...." Get the picture? How many times a month do you spout off about your boss? Do you mean it? All of it? Do you expect the person to whom you are speaking to rat you out? Think about it.

The next day the rat had a breakfast muffin with the president. They talked about a lot of things, but not too smoothly, I am sure, since sustained conversation with a cheeping

rodent is almost impossible. When the conversation flagged, however, Stanky had a gift for his man.

At 8:47, Walt strode into my office and closed the door. "I want Morgenstern out of here," he fumed. "This is a time when secrecy and loyalty are important above all other things," he growled. "It's time to circle the flag and fight to take the field. We don't need second-guessing. We need to know that the man at our back will protect our flanks." (I don't know if I'm getting all the military terminology right. Sometime in 1993, we moved from sports metaphors to armed-forces lingo. I'm still new to it, although I do like it quite a bit. I was getting tired of punting and swinging for the fences and aiming for nothing but net and stuff.)

"How do you know all this?"

"Stanky," said Walt, and was gone.

But, of course, I know. Most of us around here are basically good guys. We have our disagreements. But we'd never rat to dad about stuff like this. Lord, if we did...brrr...

I called the putrescent little weasel into my office and, swallowing my tongue as best I could, inquired of the mass of pustulation why in the world he had turned in his brother executive. And this is what he said to me: "We're in a competitive struggle for the future of this company. We're playing for real marbles here, and we need to know whether you're on this bus or you're off it."

Wow, I thought. The fetid little prune has been with us for all of six months. Who's he to decide who's on the frigging bus?

I believe my mouth was hanging open. Taking advantage of this lacuna in proceedings, the Stankmaster wheeled with what must have been meant to pass for wounded dignity and stalked from the room. And I saw he was not sorry. And I was afraid.

A couple of pals and I sat down with Morgenstern. We spent the best part of the week helping him craft an approach to Walt that culminated in a superficially cordial meeting in which the poor schmendrick puked and groveled in order to right the wrong that was done to him. Today, bloody

T	H	E	?
C	O	M	P
U	T	E	R
B	O	W	L

I could never get him back.

Would never want to. I alone

He left me swimming

dreams. I alone must match wits

in a stream of compression

in a challenge of intellectual

algorithms

stamina and tenacity, test my

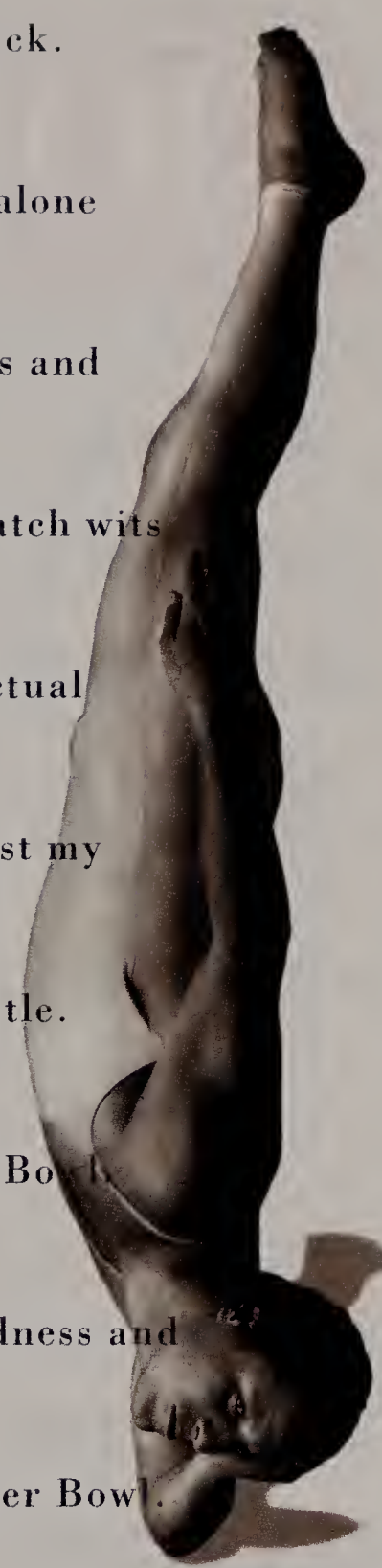
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and trailing filthy gauze after him, he is back on the job. In a couple of months, all will have been forgotten. Executive amnesia is a wonderful thing.

What we will do with Stanky is another matter altogether. Right now we're in phase two of the necessary process of extermination. It goes something like this:

One: Deprivation of nutrients. The rat must be kept from all sustenance except that which will eventually sicken and kill him. First thing we did was to engineer a plum assignment for the fellow who should do just that. The rat will be conducting a policies and procedures audit at our combustible-plastics division all the way across town. Since it's a full-time post, at least for a while, he'll be needing a splendid new office there, well out of Walt's earshot and away from his major source of nourishment: private conversations. In order

to come onto our floor now, he'll need a reason of some sort. That should buy us some time. Time to plan.

Two: Spreading the poison. We'll have lots of opportunities to lay the material that will eventually knock him out: meetings to leave him out of; retreats he won't be attending; jobs he's done that might be somewhat severely critiqued in sessions from which he will be absent. In time, we might be able to feed him some story or notion that after its ingestion will blow up and choke him. We're in no hurry, now that he's out of the day-to-day political flow. Life is long.

Three: Disposal. Think people care how people are fired these days? Look at the way Frank Biondi treated Dick Snyder over at Simon & Schuster. Thirty-three years with the company? Don't let the door smack you in the ass on the way out. The time for niceties is over, apparently.

Most of the time, that's bad, and we don't do it, going so far as to choreograph a stately dance to obscure the essential brutality of such Stalinesque endgames.

Man, that will be sweet. *Is* sweet actually. It's started already, see. I'm going to an informal sit-down with a couple of guys. We'll be talking about some key strategic issues and basically just having coffee. Not in attendance will be the rat. Who wants to talk around him? And in the distance, if you listen very closely, you will hear the squeaking and shrieking of a hairy little career curling up and rattling itself to death. The rat was wrong, see. Sometimes you're not either on the bus or off it.

Sometimes you're under it. **CIO**

This column was originally published as "A Rat's Tale" in Esquire. Reprinted courtesy of the Hearst Corp. Stanley Bing is a contributing editor of Esquire.

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Editorial, Advertising and Business Offices: 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208, (508) 872-0080. **Postal Information:** CIO (ISSN 0894-9301) is published semi-monthly; monthly in July and August; and as a combined issue December 15/January 1 by CIO Communications Inc., 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208. Second-class postage paid at Framingham, MA, and at additional mailing offices. **Reprints:** Copyright 1995 by CIO Communications Inc. All rights reserved. Reproduction of material appearing in CIO is forbidden without written permission. Send all reprint requests to Permissions Editor, CIO, 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208. **Photocopy Rights:** Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CIO for users through the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, Massachusetts 01970. Please specify: ISSN 0894-9301. Permission to photocopy does not extend to contributed articles followed by this symbol: †. **Subscriptions:** Address inquiries to CIO, 492 Old Connecticut Path, P.O. Box 9208, Framingham, Massachusetts 01701-9208. CIO is free to qualified information executives. To all others the one-year basic rate is \$98 for U.S. and Canada, \$185 to foreign countries (payable in U.S. funds only). The single copy price is \$7. Please allow 4 to 6 weeks for new subscriptions to begin. **Change of Address:** Please fax a copy of current subscription label along with new address to (508) 872-0618. Allow 4 to 6 weeks for change to take effect. **Postmaster:** Send change of address to CIO, P.O. Box 489, Northbrook, Illinois 60065-9816.

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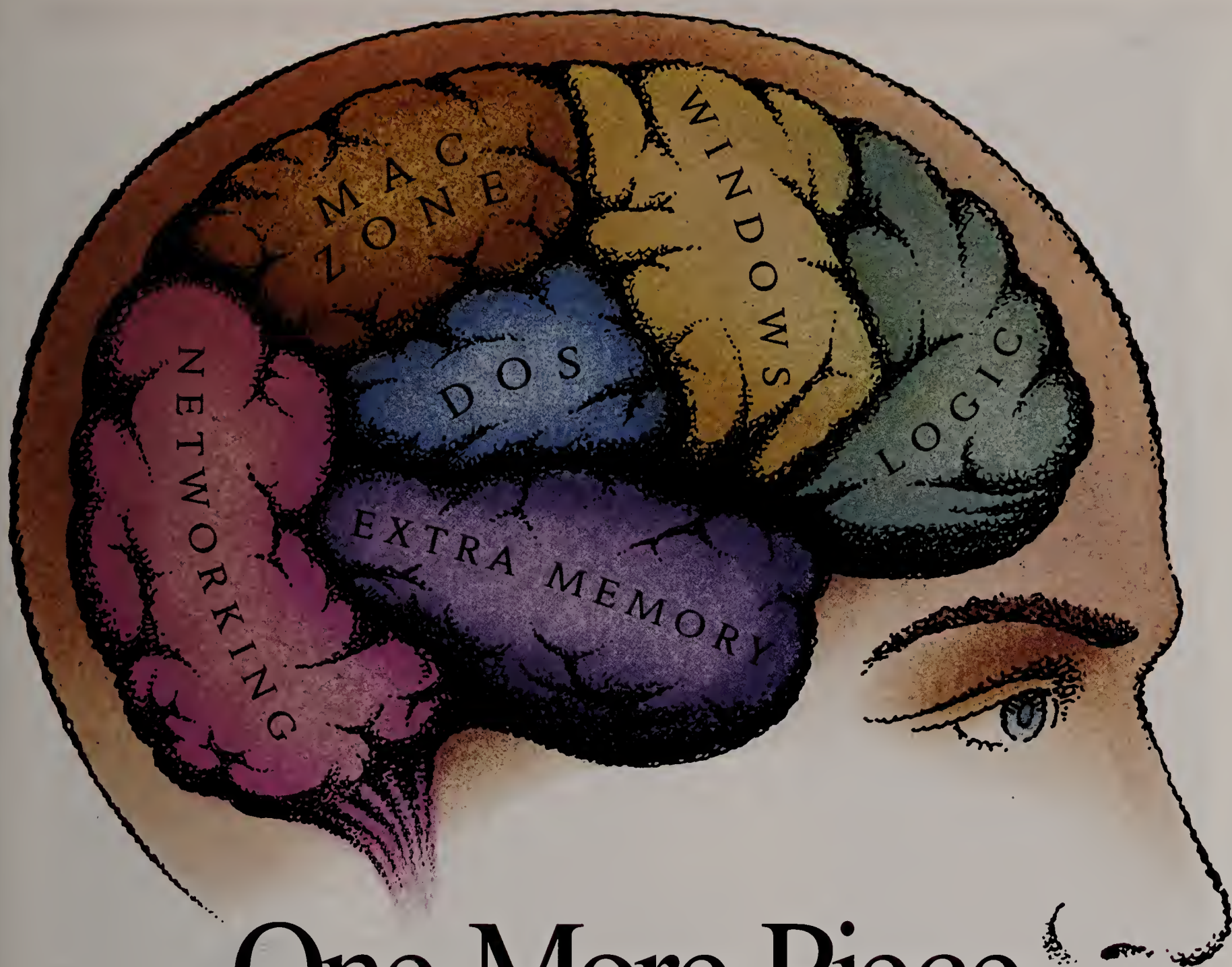
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International Data Group's publications include: **ARGENTINA'S** Computerworld Argentina, Infoworld Argentina; **AUSTRALIA'S** Computerworld Australia, Australian PC World, Australian Macworld, Network World, Mobile Business Australia, Publish!, Reseller, IDG Sources; **AUSTRIA'S** Computerwelt Oesterreich, PC Test; **BELGIUM'S** Data News (CW); **BOLIVIA'S** Computerworld; **BRAZIL'S** Computerworld, Gamepro, Game Power, Mundo Unix, PC World, Publish, Super Game; **BULGARIA'S** Computerworld Bulgaria, Ediworld, PC & Mac World Bulgaria, Network World Bulgaria; **CANADA'S** CIO Canada, Computerworld Canada, Graduate Computerworld, InfoCanada, Network World Canada, Reseller; **CHILE'S** Computerworld Chile, Informatica; **COLOMBIA'S** Computerworld Colombia, PC World; **COSTA RICA'S** PC World; **CZECH REPUBLIC'S** Computerworld, Elektronika, Macworld, PC World; **DENMARK'S** Communications World, Computerworld Danmark, Macintosh Produktkatalog, Macworld Danmark, PC World Danmark, PC World Produktguide, Tech World, Windows World; **ECUADOR'S** PC World Ecuador; **EGYPT'S** Computerworld (CW) Middle East, PC World Middle East; **FINLAND'S** MikroPC, Tietoviikko, Tietoverkko; **FRANCE'S** Distributique, GOLDEN MAC, InfoPC, Languages & Systems, Le Guide du Monde Informatique, Le Monde Informatique, Telecoms & Reseaux; **GERMANY'S** Computerwoche, Computerwoche Focus, Computerwoche Extra, Computerwoche Karriere, Electronic Entertainment, Gamepro, Information Management, Macwelt, Netzwelt, PC Welt, PC Woche, Publish, Unit; **GREECE'S** Infoworld, PC Games; **HONG KONG'S** Computerworld Hong Kong, PC World Hong Kong; **HUNGARY'S** Computerworld SZT, PC World; **INDIA'S** Computers & Communications; **INDONESIA'S** Info Komputer; **IRELAND'S** ComputerScope; **ISRAEL'S** Computerworld Israel, PC World Israel; **ITALY'S** Computerworld Italia, Lotus Magazine, Macworld Italia, Networking Italia, PC Shopping Italy, PC World Italia; **JAPAN'S** Computerworld Today, Information Systems World, Macworld Japan, Nikkei Personal Computing, SunWorld Japan, Windows World; **KENYA'S** East African Computer News; **KOREA'S** Computerworld Korea, Macworld Korea, PC World Korea; **LATIN AMERICA'S** GamePro; **MALAYSIA'S** Computerworld Malaysia, PC World Malaysia; **MEXICO'S** Compu Edicion, Compu Manufactura, Computacion/Punto de Venta, Computerworld Mexico, MacWorld, Mundo Unix, PC World, Windows; **THE NETHERLANDS'** Computer! 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They come in the night, slurping into the corporation on little fate feet. Before you know it, they're right at the heart of the granary bin, munching away at the precious harvest of organizational life, which, of course, is trust. They are the weasels, the stoats, the plump, rodentine offal eaters which live in the interstitial fabric of the family, darting between, among, under—looking for any scrap of sustenance that will keep them alive. They eat information and present it to you later as it comes, transmuted, from the other end of their professional functions. They have teeth. They carry fear. They want you to like them. And maybe you will. Watch out. There's one coming to an office near you. When he does arrive, beware. They breed.

Today, we will consider the story of Stanky. I call him Stanky, even though that is not his real name, because when he is around that is generally how people feel. Not at first, you know. But after a while, you notice folks sort of shifting uncomfortably from one foot to the other, as if they have to visit the restroom or something.

That's the way it is with rats. Dress them up like Dr. Quinn, Medicine Woman, they still read like some subcutaneous life form out for a stroll on the nearest available rock. That's why they're always so ingratiating. Until they... turn.

Maybe that's why I allowed myself to be fooled by Stanky. He smiled a great deal when he got here as a vice president of information management. He seemed sort of sad and maladroit and intensely admiring of my entire act, an

Observe the sharp
rodentine teeth
and darting eyes.
To know him is
to feel a shiver
of dread. He is a
corporate archetype,
and if you let him,
he'll snack on your
tender career.

BY STANLEY BING



attribute I always admire in a person. His presentation was not impressive in the sense that his mustache seemed a little too trimmed, the soft spot at his waist a little too undefined, the skin of his neck a tad too moist when it didn't really have to be. An imaginary dollop of mayonnaisey tuna fish hung from his lower lip at all times. He was nauseating, in other words. But that, in itself, can be a big plus for a mid-level manager, generating guilt and desire to overcompensate in those in whom he generates a natural revulsion.

"We must get together for lunch immediately," he said to me the first time we met. We were in an elevator, and several people from alien corporations were near at hand, pretending not to listen. He was too close, and I smelled the Lavoris on his chin. "I've heard you're the absolute master of office political life around here," he said, leaning even closer to make his point. I was embarrassed. He was getting to me.

"Sure," I said. "I can get you up to speed."

I never did, though. Several times he called me for comment on some situation that had arisen, but he never did "lasso me for that famous drink," as he referred to it more than once. After a while, it was clear that he had passed beyond my purview and into the greater corporate world, where players pursue their individual agendas without consultation with me.

I was aware that he was getting rather close to Walt. Not that Walt liked him, mind you. But like a cat I once shared a house with, the Stankman would bring a dead forest animal to his

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